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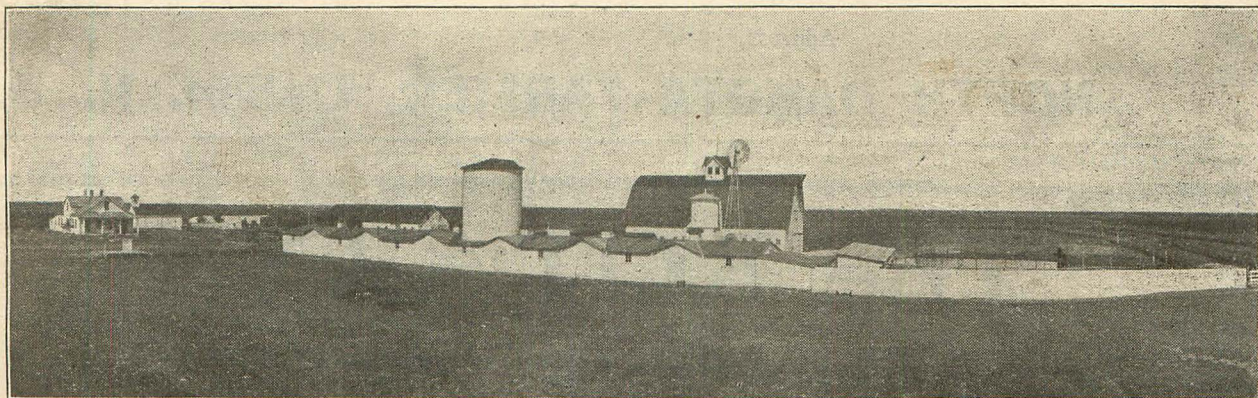
THE NORTH DAKOTA FARMER



"THE NORTH DAKOTA FARMER FOR NORTH DAKOTA FARMERS"

Vol. 12 · No. 5 Lisbon, North Dakota, November 15, 1910 50 Cents A Year

North Dakota Drama in Three Acts: Corn C,---Silo---Auto



Silo and Barns on the Farm of J. A. Edglund, Wells County



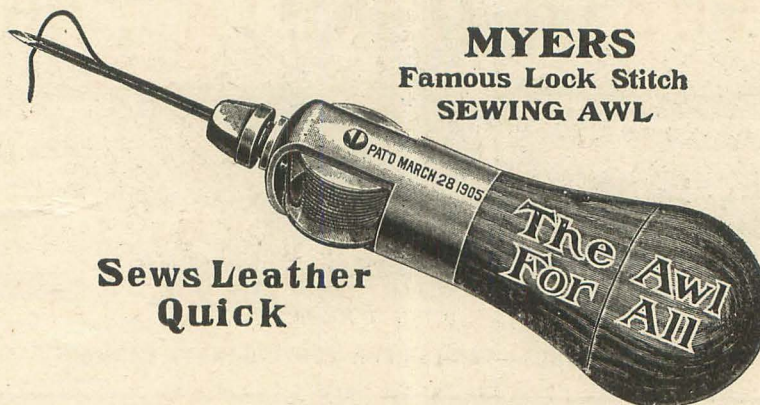
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THE ROTARY, Lisbon, North Dakota

THE NORTH DAKOTA FARMER

Vol. 12, No. 5

LISBON N. D., NOVEMBER 15, 1910

50 Cents a Year

Lessons From This Year's Harvest

By Daniel E. Willard, Author of "Story of Our Prairies"

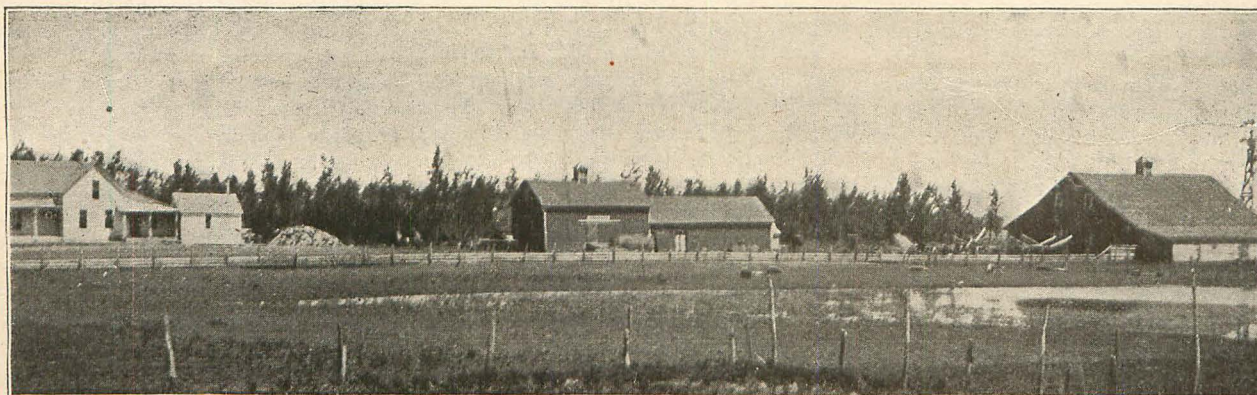
One of the best demonstrations of the value of good farming methods that has passed under our observation in many years is afforded by the crop conditions of the present season. More forceful and striking illustrations of the effects of good and bad farming could hardly be imagined than those that may be seen thruout the Northwest at the present time. A barbed wire fence not infrequently separates two fields which

undoubtedly are those farmers who every year plant peas and potatoes in the old of the moon and who every year harvest good crops. The fact that these farmers get good crops, while their neighbors who pay no attention to the moon get poor crops, may mean to them that the moon was the factor that determined the crops. With as good logic it might be argued that being on the right side of the barbed wire fence was

according to convenience. If innvenient for him to plough in the fall, perhaps he left it until spring, whereas the man who was planning on having his ground ready "in the old of the moon in April" probably made especial effort to plough in the fall so as to be ready when the "old of the moon" should come.

A Striking Example

Over in Eastern Washington are two



"As a Matter of Fact the Farmer * * * * was Probably Careful to Prepare His Ground."

represent on the one hand a good profit paying investment in farm labor, and on the other a net loss, or may be, a return that will barely pay for the seed sown and the cost of harvesting the crop, with all the expense and toil of cultivation lost.

Diligent Cultivation Important

This matter of good cultivation is no fancy dream of the idealist. It is the cold record of fact stamped upon the face of the broad acres of the great Northwest. A barbed wire fence does not separate any such differences in soil conditions or rainfall as is shown by the difference in the crops. We know full well that the barbed wire fence exerts no more influence on the crops than does the moon on peas or potatoes. There

the cause of success in one case as compared with failure on the other.

As a matter of fact the farmer who did actually study the phases of the moon and sought to regulate the cultivation of his fields accordingly was probably careful to prepare his ground so as to have it in readiness for planting at the proper time. In other words, he carefully planned and prepared his ground. And in this lies the secret of his success. While he unwittingly watched the moon he deligently prepared his ground. The other man, who perhaps was on the other side of the barbed wire fence, ploughed and harrowed when he had time. Not being controlled in his planning by any supposed superior "influence" he farmed

fields which fell under the observation of the expert farmers from the State College at Pullman who were in charge of the Northern Pacific Better Farming Special. On one of these fields a beautiful crop of oats was growing which stood full and even and beautiful all over the field. Over a barbed wire fence was another field also sowed in oats, where a short, feeble and scattering stand greeted the eye. Practically no rain had fallen on either field since the snows disappeared last spring.

It may be remarked here in passing, that last spring a heavy body of snow disappeared in a few hours under the compelling influence of a Chinook wind, and one of the most disastrous floods in the history of Southeastern Washington

occurred as a result. The significance of this will be noted later.

The soil, the rainfall, the climatic conditions, had been the same for the two fields. Both fields had been seeded in oats. At the time of our visit the heads were just developing. Or rather, it should be said the heads were developing in one field, while in the other a miserably sickening attempt at heading was rapidly drying and dwindling into a dismal failure, and a mowing machine had been started to cut and gather what little scattering hay could be secured. The one field bade fair to yield a profit over cost of \$20 per acre; the other would scarcely more than pay the cost of harvesting the scanty oat hay.

Who, now, shall say that the Lord of the harvest is unjust? Who shall declare that the rain does not fall upon the just and the unjust alike?

The Lesson of the Two Fields

Let us seek to analyze the situation further. One man had cultivated and prepared his ground with diligence. The other had apparently prepared his according to his convenience. Whether one man consulted his almanac and sowed his seed "in the moon," whereas the other sowed when he got ready, we did not inquire. May be that both men understood the principles of farming, but one practiced what he knew, whereas the other gambled with nature, trusting that since the Lord had many times sent spring showers which brought forth a fair crop even with poor cultivation (for nature has dealt bountifully in supplying good things to the soil in Eastern Washington) so may be He would again this time. We did not have time to investigate. But it may be,—and this is the sadder element in the story—may be the one man knew and practiced, knew from years of experience on Eastern Washington soils, and may be the other ploughed, harrowed and sowed in ignorance of the best farming methods for this region.

Herein, we repeat, lies the sadder element of this true story. And herein also may lie, does lie for many honest farmers who are playing a losing game, justification, need, even necessity, for movements like the Northern Pacific Better Farming Special. He who is failing because of honest ignorance deserves and should receive the aid that such a movement may bring. May be the man who failed came to this section with honest purpose to found a home and build up a competence, but came from a region where all the agricultural conditions are different. Here he may not know the conditions and may be playing the game as he knew it in Indiana or Iowa or New York. There he knew how to farm; here he does not. To such an one an obligation is due.

Many Similar Examples Known

Many cases could be cited where results similar to those that have been described may be this season seen, where the methods of cultivation have been carefully observed, so that the conclusions drawn may be set down as the result of experience. To give the benefit of such experience to the earnest man who desires to know the best methods, was one of the reasons that inspired the sending out of the Northern Pacific Better Farming Special.

Reference has before been made to the destructive flood in Southeastern Washington last spring, whereby nearly half a million dollars of damage is said to have been done in one county by the destruction of buildings, bridges and other property. Professor R. W. Thatcher, of the State College at Pullman, is authority for the statement that the damage thus done, great as it was, was but a small fraction of the actual loss which this sudden melting-of a great body of snow entailed. The loss to the farmers is now shown by the lack of moisture in the soil, and for which the crops are suffering, which moisture went rapidly down the slopes and into the streams, incidentally causing a most destructive flood, but in reality escaping so rapidly that it did not penetrate the soil, and so was lost to the crops which are now suffering for it.

Now, to return to the fields and to the conditions which different methods of cultivation have brought about: The one, the good farmer, the one who knew and practiced,—usually, by the way, the one who eagerly attends the Farmers' Institutes and who is generally alert and attentive when a Better Farming Special comes to his town—studies the conditions of his soil. He did not know that a Chinook wind was going to suddenly sweep away the winter's accumulation of snow, but he does know that the great moisture supply for the soil of his farm falls during the winter season. He does not know how much is going to come, or how much it will rain next spring during the growing season. But he does know that he needs to conserve the year's moisture for the growing crop. The man who is careless, or who is willing to gamble with the chances of spring showers, will neglect the necessary attention to his soil during the summer and fall and the early spring preceding the seed time. These two classes of farmers are represented by the conditions in such fields as have been described.

The Surface Mulch

The good farmer when he has removed the last season's crop, immediately begins operations looking toward the preparation of the soil for next year. Instead of leaving the stubble field dry

and barren to bake and crack in the large sun, allowing the weeds, those ever present and persistent moisture pumps, to draw the soil water up and dissipate it in the hot summer air, he watches for the first indication of baking and cracking in the stubble field, and at once goes upon the field with disc or harrow and forms a surface mulch of fine dust over the surface, at the same time killing the weeds and preventing the loss of moisture which is bound to result if they are allowed to grow. This surface mulch of dry dust is the salvation of next year's crop. This acts much like a rubber blanket holding the moisture within the soil, or, more correctly speaking, preventing its escape into the air. If a summer or early autumn shower happens to come—and they are likely to come in almost any locality in the Northwest—he immediately goes out again with disc or harrow as soon as the ground has dried off enough so that the soil will not stick, and forms another dust mulch so as to prevent the cracking of the surface causing loss of moisture. He studies his soil (he need not watch the moon) to guard against any avoidable loss of water from the soil.

Plough in the Fall

Before the winter freeze-up he ploughs his land and ploughs deeply, so as to have a greater body of loose soil to catch the winter moisture. If he has diligently harrowed and disced his land after the preceding harvest, his land will probably plough more easily, and will not be hard and lumpy, even if there have been no summer rains, for the dust mulch does much to keep the soil in good condition for ploughing.

The fall ploughing, too, will be treated in exactly the opposite manner to that which he pursues when ploughing immediately before seeding. In the latter case he would follow the plough immediately with a disc or harrow, so as to break up the surface portion and form a dust mulch. In the fall, however, he leaves the ploughed land rough, so that there will be a greater chance to catch the snow and hold the moisture which is bound to fall on the land during the winter.

Spring Harrowing and Seeding

With the first opening of spring, and just as soon as the fields have dried off enough so that the soil will not stick, he harrows or discs the ploughed field so as to prevent by the dust mulch formed the escape of the moisture that has been gathered into the soil.

Now, at the proper time he will sow the seed. The careful farmer will endeavor to set his drill so that the seed will be placed below the dry dust mulch in the damp soil. If the soil is

OUR AWL OFFERTAKES, PAGE 2

loose at seeding time he will go over the field with a sub-surface packer, so as to form a firm seed bed. Then, after the seed is sown, he will see that as perfect a dust mulch as possible covers the surface of the soil, for reasons that have already been emphasized, viz.: to prevent the escape of the soil moisture into the air.

Cultivating the Grain Crop

And now it would seem that all has been done. No, not yet. After the seed has germinated and grown till the plants are well up and the field looks green, he goes upon the field with a light harrow. Here the timid will shrink, and if he looks back over the harrowed strip his heart may fail him and he may leave the field fearing he will destroy the young plants. But the man who has had experience will courageously look ahead and never glance back over his shoulder.

Nor is this all. Some of the most successful "dry" farmers will tell the inquirer that they harrow three and even four times at intervals during the growing season. Yes, some of the best farmers harrow the growing grain, using preferably a "weeder," a long spring-toothed implement, continuing till the grain begins to head out.

The other man, the man whose land was on the other side of the barbed-wire fence, did not study his soil conditions so carefully; did not take care to keep the all-important dust mulch ever there; did not cultivate the growing grain; but he did take chances on the spring and early summer rains, and this season these did not come. He gambled with nature, and this season he lost.

WHAT THE DEMONSTRATION FARMS ARE DOING FOR NORTH DAKOTA

By W. R. Porter

(Concluded from October)

The demonstration farms are also used to do a certain amount of experimental work. For instance, winter wheat was seeded on seven of these farms in the fall of 1909. It was seeded broadcast in standing corn, was drilled in barley stubble and was drilled into summer fallow. On three of these farms the wheat never germinated on account of the excessively dry weather that fall. At Page in the eastern part of the state it made a good fall growth in the corn and on summer fallow but failed to grow in the stubble. This wheat winter-killed on this farm. On the other three farms it came thru the winter in fair condition and produced a fair crop of wheat considering the adverse conditions the past summer.

In August this year, winter wheat was seeded on fifteen of the demonstration farms in the corn, on summer fallow and in stubble. A one-horse drill was used to seed the wheat in the corn. On prac-

tically all the farms the winter wheat is making an excellent fall growth. This experiment should very quickly show the farmers of North Dakota on their own farms whether winter wheat will succeed and what is the best method of seeding it.

The leguminous crops, alfalfa, clover and Canada field peas are being thoroly tested out on these farms under exactly the same conditions the farmer has to meet himself. The results of all these experiments are summed up and published so that farmers who are too far away to see any of these farms may get the benefit of the experiments to as great an extent as possible.

Pedigree seed is used on all these farms as far as practicable. The farmers who own adjoining farms have been securing their seed to a greater or less extent from their respective demonstration farms. The North Dakota Experiment Station as well as the other experiment stations of the northwest have been breeding superior varieties of grain such as Minnesota No. 163 Fife wheat and North Dakota No. 155 Flax. These have been sent out to farmers who in many cases have sold all they grow to the elevators or allowed them to become impure thru mixing with other grains. Unscrupulous seedmen have sold common scrub grains under the name of the pedigree varieties. This has tended to greatly depreciate the real value of pedigree seed. The North Dakota Experiment Station intends to give every farmer in the state a chance to get pure pedigree seed grain if he so desires. Much is to be accomplished thru the supplies of seed grain produced on the demonstration farms. This grain which is grown under the supervision of the experiment station will be threshed and stored separately if it is a No. 1 grade. It will be cleaned up and sacked under the direct supervision of the Station. These sacks will be sealed with the North Dakota Experiment Station Seal and they will then be sold to the farmers of the same county in which the grain has been produced. In this way every farmer that buys this seed grain sealed in the original packages will be sure of getting what he is paying for. By this method the North Dakota Station is not only originating valuable varieties of pedigree seed but is keeping them under its immediate control after they are produced and is putting them directly into the hands of the farmers of the state who wish to grow them. This is being tried for the first time this year and it gives promise of being of much more value to the state than the entire cost of running the twenty-four farms now in operation.

One of the most attractive features of the Fourth Annual National Corn Exposition, to be held on the Ohio exposition grounds at Columbus, Ohio, January 30 to February 11, will be the specially painted scenery in the Educational building. This elaborate scenery, which is now being painted under the direction of E. E. Sprague, a prominent Columbus artist, who is in charge of all the scenic effects for the exposition, will be a revelation to the visitors. Especially will it be noticeable to those who have attended past expositions of the National Corn Association. The scenery will be 600 feet long and 12 feet high, making a total of 7,200 square feet, and will depict scenery of each state represented at the exposition. At former expositions of this association arches were used in front of each state exhibit, with the name of the state done in grains and grasses. The scenic feature is the idea of Secretary G. H. Stevenson, who is giving special attention to all the details in connection with the coming exposition, with the view of making it a most pleasing sight, aside from the thousands of instructive features, all of which will be equally interesting to the agriculturist as well as the man, woman or child who are uninformed on the subject of agriculture in any form. Photographs have been made of sample scenery painted by Artist Sprague and have commanded much comment from all who have seen them.

MIGHT BE OF VALUE TO US

Consul Ellsworth reports from Ciudad Portfrio Diaz, Mexico, that Dr. C. C. Young has been experimenting in the breeding of Karakule sheep, imported from Bokhara in the Far East. He has a flock of 40 full-blooded animals. These sheep are famed for fine wool, which is in reality fur and they are doing well in Mexico.

Even in Chile they beat us out on grain production. The average yield for the country last year was between 15 and 16 bushels per acre, or more than a bushel higher than in the United States. The additional use of nitrate and other fertilizers, together with the use of more improved machinery and up-to-date methods employed, are stated to be helping the agricultural interests materially. The Government is encouraging the farmers by giving them special rates on the railroads for the transportation of fertilizers, etc.

XMAS COMING! See page 10

Conservation the Great Problem

By Theodore Roosevelt

There are no two public questions of more vital importance to the future of this country than the problem of conservation and the problem of the betterment of rural life. Moreover, these two problems are really interdependent, for neither of them can be successfully solved save on condition that there is at least a measurable success in the effort to solve the other.

In any great country the prime physical asset—the physical asset more valuable than any other—is the fertility of the soil. All our industrial and commercial welfare, all our material development of every kind, depends in the last resort upon our preserving and increasing the fertility of the soil. This, of course, means the conservation of the soil as the great natural resource; and, equally, of course, it furthermore implies the development of country life, for there can not be a permanent improvement of the soil if the life of those who live on it, and make their living out of it, is suffered to starve and languish, to become stunted and weakened and inferior to the type of life lived elsewhere.

Two Sides of Same Policy

We are now trying to preserve, not for exploitation by individuals, but for the permanent benefit of the whole people, the waters and the forests, and we are doing this primarily as a means of adding to the fertility of the soil; altho in each case there is a great secondary use both of the water and for the forests for commercial and industrial purposes.

In the same way it is essential for the farmers themselves to try to broaden the life of the man who lives in the open country; to make it more attractive, to give it every adjunct and aid to development which has been given to the life of the man of the cities. Therefore, friends, the conservation and rural life policies are really two sides of the same policy; and down at bottom this policy rests upon the fundamental law that neither man nor nation can prosper unless, in dealing with the present, he steadily take thought for the future.

In one sense this problem with which we have to deal is very, very old. Wherever civilizations have hitherto sprung up they have always tended to go thru certain stages and then to fall. No nation can develop a real civilization without cities. Up to a certain point the city movement is thoroly healthy, yet it is a strange and lamentable fact that always hitherto after this point has been reached the city has tended to develop at the expense of the country by draining the country of what is best in it,

and making an insignificant return for this best.

Shall Cities Prosper and Men Decay

In consequence, in the past, every civilization in its later stages has tended really to witness those conditions under which "the cities prosper and the men decay." There are ugly signs that these tendencies are at work in this nation of ours. But very fortunately we see now what never before was seen in any civilization—an aroused and alert public interest in the problem, a recognition of its gravity and a desire to attempt its solution.

The problem does not consist merely in the growth of the city. Such a growth in itself is a good thing and not a bad thing for the country. The problem consists in the growth of the city at the expense of the country; and, even where this is not the case, in so great an equality of growth in power and interest as to make the city more attractive than the country, and therefore apt to drain the country of the people who ought to live therein.

The human side of the rural life problem is to make the career of the farmer and the career of the farm laborer as attractive and as remunerative as corresponding careers in the city. Now, I am well aware that the farmer must himself take the lead in bringing this about. A century and a quarter ago the wise English farmer, Arthur Young, wrote of the efforts to improve French wool: "A cultivator at the head of a sheep farm of 3,000 or 4,000 acres would in a few years do more for their wools than all the academicians and philosophers will effect in ten centuries." It is absurd to think that any man who has studied the subject only theoretically is fit to direct those who practically work at the matter.

The Scientific is the Practical Way

But, friends, I wish to insist to you here—to you practical men, who own and work your farms—that it is a pernicious absurdity for the practical man to refuse to benefit by the work of the student. The English farmer I have quoted—Young—was a practical farmer, but he was also a scientific farmer.

One reason why the great business men of today—the great industrial leaders—have gone ahead while the farmer has tended to sag behind the others, is that they are farmers willing, and indeed eager, to profit by expert and technical knowledge—the knowledge that can only come as a result of the highest education.

From railways to factories no great

industrial concern can nowadays be carried on save by the aid of a swarm of men who have received a high technical education in chemistry, in engineering, in electricity, in one or more of scores of special subjects. The big business man, the big railway man, does not ask college-trained experts to tell him how to run his business, but he does ask numbers of them each to give him expert advice and aid on some one point indispensable to his business. He finds this man usually in some graduate of a technical school or college in which he has been trained for his life work.

Learning No Good Unless Used

In just the same way the farmers should benefit by the advice of the technical men who have been trained in phases of the very work the farmer does. I am not now speaking of the man who has had an ordinary general training, whether in school or college. While there should undoubtedly be such a training as a foundation (the extent differing according to the kind of work each boy intends to do as a man), it is nevertheless true that our educational system should more and more be turned in the direction of educating men toward and not away from the farm and the shop. During the last half century we have begun to develop a system of agricultural education at once practical and scientific, and we must go on developing it. But after developing it, it must be used.

The rich man who spends a fortune upon a fancy farm, with entire indifference to cost, does not do much good to farmers; but, on the other hand, just as little is done by the working farmer who stolidly refuses to profit by the knowledge of the day; who treats any effort at improvement as absurd on its face, refuses to countenance what he regards as newfangled ideas and contrivances, and jeers at all "book farming."

I wish I could take representatives of this type of farmer down to Long Island, where I live, to have them see what has been done, not as philanthropy, but as a plain business proposition, by men connected with the Long Island railroad, who believe it pays to encourage the development of farms along the line of that railway. They have put practical men in charge of experimental farms, cultivating them intensively and using the best modern methods, not only in raising crops, but in securing the best market for the crops when raised. The growth has been astounding, and land only fifty miles from New York,

which during our entire national lifetime has been treated as worthless, has within the last three or four years been proved to possess a really high value.

Cannot Stop March of Events

The farmer, however, must not only make his land pay, but he must make country life interesting for himself and for his wife, and his sons and daughters. Our people as a whole should realize the infinite possibilities of life in the country, and every effort should be made to make these possibilities more possible. From the beginning of time it has been the man raised in the country—and usually the man born in the country—who has been most apt to render the services which every nation most needs. Turning to the list of American statesmen, it is extraordinary to see how large a proportion started as farm boys. But it is rather sad to see that in recent years most of these same boys have ended their lives as men living in cities.

It often happens that the good conditions of the past can be regained, not by going back, but by going forward. We cannot recreate what is dead; we cannot stop the march of events, but we can direct this march and out of the new conditions develop something better than the past knew. Henry Clay was a farmer who lived all his life in the country; Washington was a farmer who lived and died in the country, and we of this nation ought to make it our business to see that the conditions are made such that farm life in the future shall not only develop men of the stamp of Washington and Henry Clay, but shall be so attractive that these men may continue as farmers, for remember that Washington and Henry Clay were successful farmers. I hope that things will so shape themselves that the farmer can have a great career and yet end his life as a farmer; so that the city man will look forward to living in the country rather than the country man living in the city.

Farmers should learn how to combine effectively, as has been done in industry. I am particularly glad to speak to the grange, for I heartily believe in farmers' organizations, and we should all welcome every step taken toward an increasing co-operation among farmers. The importance of such movements cannot be overestimated, and thru such intelligent joint action it will be possible to improve the market just as much as the farm.

Should Be as Attractive as the City

Country life should be as attractive as city life, and the country people should insist upon having their full representation when it comes to dealing with all great public questions. In other words, country folks should demand that they work on equal terms with city folks in all such matters. They should have their

share in the memberships of commissions and councils—in short, of all the organized bodies for laying plans for great enterprises affecting all the people. I am glad to see on such bodies the names that represent financial interests, but those interests should not have the right of way, and in all enterprises and movements in which the social condition of the country is involved the agricultural country—the open country—should be as well represented as the city. The man of the open country is apt to have certain qualities which the city man has lost. These qualities offset those which the city man has and he himself has not. The two should be put on equal terms and the country talent be given the same opportunity of the city talent to express itself and to contribute to the welfare of the world in which we live.

Church True Social Center

The country church should be made a true social center, alive to every need of the community, standing for a broad individual outlook and development, taking the lead in work and in recreation, caring more for conduct than for dogma, more for ethical, spiritual, practical betterment than for merely formal piety. The country fair offers far greater possibilities for continuous and healthy usefulness than it at present affords. The country school should be made a vital center for economics, social and educational co-operation; it is naturally fitted to be such a center for those engaged in commercial farming, for those who live on and by the small farms they themselves own. The problem of the farm is really the problem of the family that lives on the farm. On all these questions there is need of intelligent study, such as marks the books of Prof. Bailey of Cornell and of Horace Plunkett's book on the "Rural Life Problems of the United States."

One feature of the problem should be recognized by the farmer at once, and an effort made to deal with it. It is our duty and our business to consider the farm laborer exactly as we consider the farmer. The country life cannot be satisfactory when the owners of farms tend, for whatever reason, to go away to live in cities instead of working their farms; and, moreover, it cannot be really satisfactory when the labor system is so managed that there is for part of the year a demand for labor which cannot be met and during another part of the year no demand for labor at all, so that the farmers tend to rely on migratory laborers who come out to work in the country with no permanent interest in it and with no prospect of steady employment.

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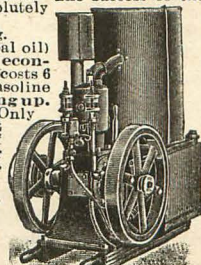
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Are you looking for a farm in Central Missouri? I have farms in wheat, corn and fruit belts for sale or exchange. If you are interested, write for list and full particulars. If you have something to trade, send description and tell me what you want.

Write J. S. LUMPKIN, Eldon, Mo.

tinuity in the work which means to him his livelihood. Economic conditions on the farm—in variety and kind of crop-growing, especially as distributed for the men—must be so shaped as to render it possible for the man who labors for the farmer to be steadily employed under conditions which foster his self-respect and tend for his development.

Welfare of the Farmer's Wife

Above all, the conditions of farm life must always be shaped with a view to the welfare of the farmer's wife and the farm laborer's wife, quite as much as to the welfare of the farmer and the farm laborer. To have the woman a mere drudge is at least as bad as to have the man a mere drudge. It is every bit as important to introduce new machines to economize her labor within the house as it is to introduce machinery to increase the effectiveness of his labor outside the house.

I haven't the slightest sympathy with any movement which looks to excusing men and women for the non-performance of duty and fixes attention only on rights and not on duties. The woman who shirks her duty as housewife, as mother, is a contemptible creature; just as the corresponding man is a contemptible creature. But the welfare of the woman is even more important than the welfare of the man, for the mother is the real Atlas who bears aloft in her strong and tender arms the destiny of the world. She deserves the honor and consideration such as no man should receive. She forfeits all claim to this honor and consideration if she shirks her duties. But the average American woman does not shirk them, and it is a matter of the highest obligation for us to see that they are performed under conditions which make for her welfare and happiness, and for the welfare of the children she brings into the world.

INTER-STATE FAIR AT COLORADO

One of the most interesting exhibits at the Inter-State Fair and Exposition at Denver, Colorado, will be the big display of ores and minerals gathered at great expense for the purpose of showing the product of Western mines.

This magnificent collection comprises some of the richest and rarest specimens to be found in the state.

There is not a mining district in the West that is not well represented by specimens of this collection. Numerous specimens of Pitchblend, that wonderful mineral from which radium is extracted together with other radio active minerals, will also be shown.

Some of the importance of the mining industry may be gained when one stops

to consider the fact that within the past fifty years Colorado mines alone have produced over eleven hundred millions of dollars, including gold, silver, lead and copper.

Among other interesting features in connection with this exhibit will be the working mine models showing miniature men in the different levels and stops, realistically engaged in extracting the precious metals from Mother Earth. This is a most wonderful piece of mechanical genius, requiring great patience and skill to construct.

Many owners of private collections will also exhibit their ores in competition for the handsome prizes offered.

John Normile has charge of the mineral exhibit.

YARN AND CLOTH FROM FLAX AND HEMP WASTE

Considerable interest has been manifested by those identified with the cotton, flax and hemp industries in the United States in a recent report from Consul-General John H. Snodgrass, at Moscow, relating to growing and methods of treating hemp and flax in Russia, especially to that part concerning a new method discovered by Engineer Vladimin M. Shevelin, whereby the refuse which heretofore included the larger part of the product and which was considered useless except for calking purposes, may be refined and converted into flax wool; Engineer Shevelin claims that he is able to spin yarn as fine as No. 40 and weave it into cloth equal in quality to that manufactured from long-fiber flax and hemp. He estimates that the quantity of waste now being utilized for industrial purposes is about 72,000,000 pounds, of a total of approximately 720,000,000 pounds, the remainder being used as fuel or manure, and thrown out as useless. The waste, which contains about 50 per cent of fiber, is in many instances, used by the peasants of the flax and hemp-growing districts in Northern Russia for improving the muddy roads in the villages. The annual production of yarn in Russia averages about 162,000,000 pounds, and this output, it is claimed,

can be increased from 162,000,000 to 360,000,000 pounds by employing his method.

FORMALIN TREATMENT FOR GRAINS

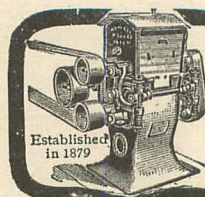
The Utah Experiment Station has recently conducted some tests to determine the effect of formalin on the Vitality of Seed Grain and found that the formalin treatment is effective in preventing the loose and covered smut of oats, the covered smut of barley and bunt of wheat, but the solution, even as dilute as one pound of formalin to sixty gallons of water, reduces somewhat the vitality of the seeds of wheat, oats and barley, altho oats are more resistant to the influence of formalin than are wheat and barley. The best strength of solution to use is one pound of formalin to fifty gallons of water. The seed may safely be treated for one hour in a solution of this strength and if thoroly dried, may be safely kept for at least six weeks after treatment.

The farmer should exercise great care in the purchase and use of formalin for grain smuts. He should purchase a guaranteed 40% solution of formalin from a reliable drug company, and use it in the proportion of one pound to fifty gallons of water.

INTEREST IN CONCRETE CONSTRUCTION

Employees of the Department of Agriculture who, during the past summer have been engaged in field work for the Department, are beginning to return and quite a number of them report that the use of concrete construction among the more progressive farmers of the west is phenomenal. Steps, walks, foundations, porches and outbuildings are being made of it.

The truth of these reports seem to be borne out by the fact that there has been an unprecedented rush for the two bulletins published by the Department on Concrete Construction on the Farm. Unfortunately, the officials say, the Department's edition of these bulletins is exhausted. The only way they can be obtained is thru members of Congress or the Superintendent of Documents, who has them for sale.



ROLLER FEED MILLS

The only scientific and up-to-date method of grinding feed. Burr and stone mills have had their day. At present cost of land and labor you can't afford to feed whole grain—one-half of it properly ground by our roller process has equal value. Our mills have great capacity—require little power—last a life-time. Built in 13 sizes to suit any power. Write for catalog D 6

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PROF. SHEPPERD APPRECIATED

The following article which is given in the last copy of the Breeders Gazette published at Chicago should prove of interest to North Dakota Farmers: Prof. J. H. Shepperd's article some months ago describing his farm bath tub solved the problem for the writer of a cooler for his pigs, and how they do enjoy it! There must be something elevating to a pig as to a man in a bath, for tho a hundred come at once from the scorching pasture, their behavior is most courteous. A few lie down, squirm around a bit then come out to rub or lie down in the shade. It is probable that the dip used in the water—about one quart to 75 gallons—has most to do with the improved manners, as it has all to do with the rubbing.

Making the tub is simple enough if one has or can procure some 2 inch or 2½ inch by 12 inch planks cut 8 feet to 12 feet long. Make an excavation 12 inches deep and 8 feet, 6 inches and say 12 feet, 6 inches wide and long, fill about 4 inches deep with good cement mortar; then the planks are spiked together firmly and set on the mortar. This is about all there is to it. Sediment will soon take care of the corners. The only other things are plenty of water and a good dip in about the proportions named to help drive away vermin. I have not found an outlet necessary, never having used the one I made. The bottom of the cooler being solid, there is very little to thicken the water, as in the mud bottomed wallows of "ye olden time." Thanks again to Prof. Shepperd for his timely article—no, not timely either, for he seems to have known all about this for years.

Subscriber. Tippecanoe Co., Ind.

DICKEY COUNTY CORN CONTEST

The Dickey County Corn Contest was held the later part of October at Oakes. In spite of the dry weather, the early and late frost and a severe hail storm there was a fine exhibit of corn, indicating what can be done when all the conditions are unfavorable.

The Oakes Commercial Club had put up \$400 in cash prizes, 106 in all. The prize of \$50 offered for the best single ear was won by Charles Blumer, Ellendale. 34 prizes were offered on Northwestern Dent. The first \$25 was won by Willie Johnson, Ellendale; 2nd, \$15 by Odil Olson, Glover; 3rd, \$10 by Albert Heine, Ellendale. 34 prizes were offered on Yellow Dent. First prize, \$25 won by Emil Dethlefsen, Oakes; 2nd, \$15, Peter Burkardt, Guelph; 3rd, \$10 by Oscar Swanson, Oakes. 34 prizes on White Dent. First \$25 won by Andrea Dethlefsen, Oakes; 2nd, \$15 by Thomas Burkhardt Guelph; 3rd, by Joe Billmeyer.

The plan of the corn contest is this. The corn is selected and sent out by the Extension Department of the Agricultural College. Sufficient so that each student gets 600 kernels. The county superintendent distributes it to the school children of the county who are to plant 100 hills, tend to it and in the fall to enter ten ears in the contest.

There was also an essay contest on "How I Grew My Corn. The first prize \$8 was won by Henry Nelson, Oakes. He had tried putting salt-peter on a part of his patch and from this had secured much better corn than from the part not treated. Second prize, \$4 by Mabel Peterson. Third prize, \$3, Lynch Leslie. Most of the contestants were from ten to fourteen years of age.

There was also a fine exhibit of work done by pupils of the county, consisting of woodwork, drawing, weaving, embroidery, dressmaking and other lines. This was material that had been pre-

pared for what is called the school rally. This is held once a year. Prizes are offered for the best in the different lines, as well as for the ones who win in the spelling match, in the declamatory contest, writing contest, rapid adding contest. The merchants, real estate men, bankers and others put up cash prizes usually aggregating some \$125. In the evening of the rally day the common school graduation is held. Mrs. Lovell, the County Superintendent states that there are five times as many that graduate now that the exercises are held. And when they graduate they usually go on with their education. Mrs. Lovell is very enthusiastic and is doing a great deal to increase the efficiency of the schools by having things for her pupils that appeal to their interest. The boys and girls for instance that were in the corn contest took a great interest in it, and felt an importance that it would be difficult to bring about in any other way. There was also a fine exhibit of vegetables and grains.

FROM THE NATION'S CAPITOL

By GUY E. MITCHELL

AHEAD OF EUROPE IN ROAD BUILDING

Walter A. Crosby, the chief engineer of the Maryland Geological Survey, who was a delegate at the International Good Roads Congress at Brussels, says that in sixteen years the United States has built more good roads than Europe has in nearly as many centuries. He said, however, that this country was behind Europe in maintenance of roads.

Grain shipments thru the Lakes, for the first eight months of the present season, were 56,980,206 bushels, a considerable increase over the corresponding 1909 figures of 44,481,145 bushels, all the principal grains except rye sharing in the increase.

Emerson says that the true test of civilization is not the census, nor the size of the cities, nor even the crops—no, but the kind of man the country turns out.

Inasmuch as boracic acid exists normally in most fruits in small quantities, it has been decided by French authorities hereafter to subject California dried fruits to an analysis less stringent than the former one.

AMERICANS IN CANADA

Canada continues to get American farmers. U. S. Consul Conant reports that homestead entries in Canada for

the six months ending July 31, 1910, show the large increase of 11,852 over the similar period of 1909, the entries numbering 33,416. For July alone there were 4,260 entries, of which 1,248 were made by Canadians residing in Canada, 58 by Canadians returning from the United States, 959 by United States citizens, and with the exception of 34 entries the whole of the remainder were made by persons from the British Isles and northern European countries, in which the government is carrying on immigration work.

Of the entries from the United States, over one-half were made by people coming from North Dakota and Minnesota.

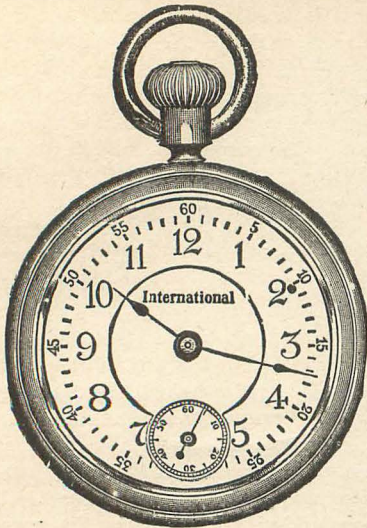
STORAGE OF MOISTURE IN THE SOIL

The Nebraska Experiment Station recently made some tests in order to determine the movement of moisture in soils and the necessity of storing water during periods of wet weather to be used during periods of drought. From the data collected the following conclusions were drawn:

"Land which is under thoro cultivation absorbs water much more freely than land not under cultivation or which is covered with grass or for any reason has a hard surface.

"Land under thoro cultivation loses but little water from below the first foot by surface evaporation so long as the mulch is kept in good condition.

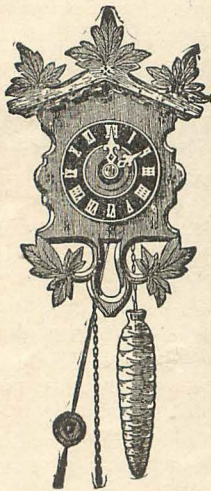
"A growing crop uses water from the
(Continued on page 12)



This stem wind Watch for Boys is given for three Subscriptions at 50 cents each.



14K Gold Fountain Pen given for two Subscriptions at 50 cents each.

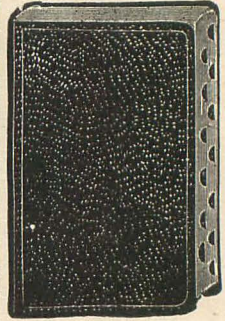


A Cuckoo Clock for only three Subscriptions at 50 cents each.

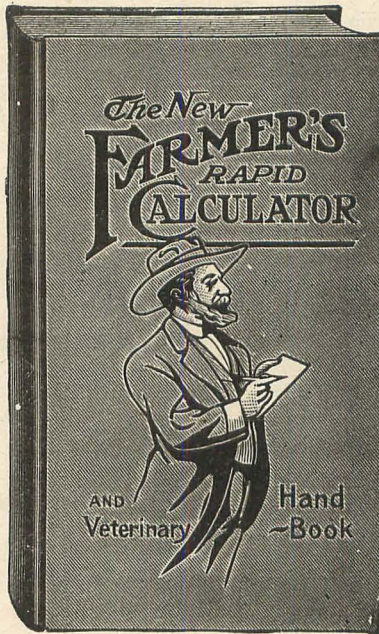
Xmas Premiums JUST A LITTLE WORK

All Premiums are sent absolutely free, express or post paid.

Old or New Subscriptions to the
North Dakota Farmer
Lisbon, N. D.



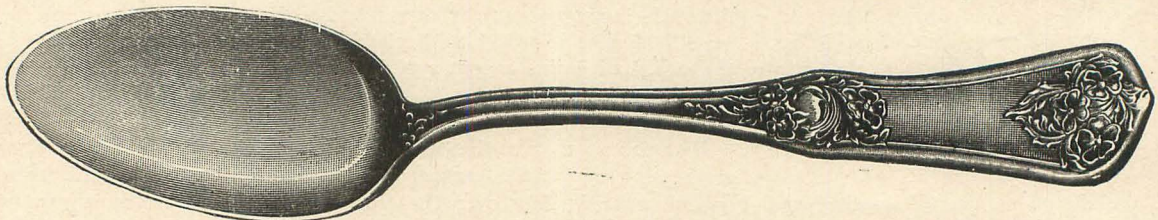
Size 6x9
Webster's School Dictionary for three subscriptions at 50 cents each.



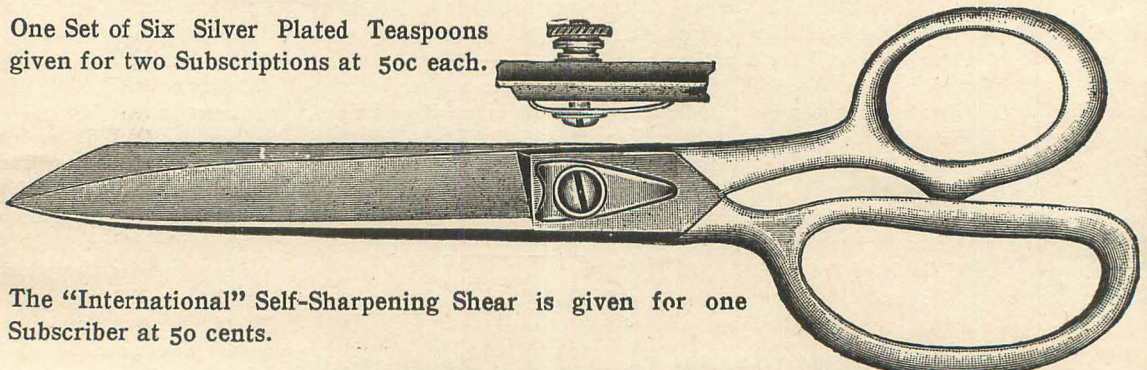
Rapid Calculator and Veterinary Hand Book for the Farmer. Given for one Subscription at 50 cents.



Stereoscope and 25 Views for the Young Folks. Given for 3 subscriptions at 50c each



One Set of Six Silver Plated Teaspoons given for two Subscriptions at 50c each.



The "International" Self-Sharpening Shear is given for one Subscriber at 50 cents.

AMONG OUR ADVERTISERS.

DOMESTICATED ANIMALS AND PLANTS

The aim of this work is to stimulate a widespread interest in domesticated animals and plants—to account for their origin, describe their life in the wild, explain their appropriation by man, show our dependence upon their services, state clearly the methods and principles of their further improvement—and, incidentally, to explain heredity in such a simple way as to bring within the range of the young student and the general reader the main facts of transmission, applicable alike to plant and animal improvement, and to human relations as well.

The literature of this subject is too intensely technical for the ordinary reader. The endeavor has been to make this book so simple and clear that it may be adapted alike to the secondary school, normal school, college, and to the needs of the general reader. 8vo, cloth, 321 pages, illustrated, list price \$1.25. By Eugene Davenport, Dean of the College of Agriculture, University of Illinois. Published by Ginn & Company, Chicago.

DETROIT KEROSENE ENGINE

One of the most successful exhibits shown at the recent state fairs was that of the Detroit Engine Works, in which the amazing Detroit Kerosene Engine was the big feature. The powerful little engine was always surrounded by a large crowd. It was a saying at some of the fairs that "Wherever you find the biggest crowd you will find the amazing Detroit Kerosene Engine." The crowds were always lined up four and five rows deep around its exhibit.

A small size Detroit Kerosene Engine was shown performing eight different tasks at the same time. This little marvel was able to run a cream separator, a barrel churn, a water pump, a wood saw, a corn-sheller, footmill, an electric light storage battery outfit and a washing machine. Instantaneous sales were made at every exhibit as soon as the wise farmer had a chance to see the little giant in operation.

The cost of running the kerosene wonder is considerably less than if any other kind of fuel was used. Kerosene is uniformly cheaper than gasoline or other fuel. This little engine sells at a low price and will be sent to anyone on trial. The prospective purchaser is made the sole judge of whether he is satisfied with the powerful little engine or not. If he does not like it, all he has

to do is to return it to the Detroit Engine Works and the trial will have cost him nothing.

Every reader of this paper should send for the free "Book of Revelations" about the Detroit Kerosene Engine. Write to the Detroit Engine Works, 385 Bellevue Ave., Detroit, Mich.

New advertisers. Our readers will please notice the advertisement of the Watertown Hide & Fur Co., of Watertown, S. Dak., who solicit your shipments. This firm comes to us with highest recommendations. They buy hides, furs and wool; and they tan hides for robes, coats and rugs. Write them, and get their prices.

Weil Bros. & Co., the old established Fur House of Fort Wayne, Ind., begin this season's advertising with us with this issue. It would pay readers of this paper to look up this advertisement and write them, and get their new price list, and their free Trapper's Guide, which they send without charge to all who enquire. This House has been in business since 1871. They employ a large capital, and they are offering some special prizes to Hunters and Trappers, which are fully explained in their circular, which they will send if you write them. We hope our readers who are interested will do so.

CEREKOTA

It is a pleasure to commend a product of which one has personal knowledge. Just a block from this office is manufactured a pancake flour of excellent flavor, and of high grade ingredients. To the housewife who appreciates a "quick-meal" these cold mornings this pancake flour will be most acceptable. Mix with a little cold water or milk and bake. Cerekota is sold, or should be, by dealers generally. Ask for it.

Of late years the fur animals of North Dakota have flourished, as little trapping has been done, but the present season promises to yield a good harvest of furs. It will be to your advantage to keep in touch with the market. Write to Pembers Hide & Fur House, Drawer 37, Onawa, Iowa, to have your name placed on their mailing list.

On page 10 of this issue you will find some valuable premiums offered. They have been selected with great care and you will be surprised at their value.

As they are given for renewals as well as for new subscriptions, every subscriber should take advantage of the offers, which may be withdrawn at any time.

Wonderful Work.

Grand St. Maspeth, N. Y. Oct. 5, '09.
DR. B. J. KENDALL CO.,
Gentlemen:—I have used Kendall's Sapvin Cure and found it to do wonderful work, the same as is represented. I would be very thankful if you would send me one of your Treatise on the Horse.

Yours truly,
William Fritz.

TO THE FLAX GROWERS OF NORTH DAKOTA

H. L. Bolley, Agricultural College, N. D.

There are perhaps a large number of farmers in this state who do not realize the small amount of flax seed that there is available for use the coming year in some parts of the state. There are places in which the crop has been almost a complete failure because of the excessive drouth at the time the grain was seeded. There are other places where flax wilt and drouth acting together have destroyed the crop.

I am writing this note to call the attention of those farmers who expect to sow flax next year, that it would be wise for them to look about their neighborhood and buy some of the best seed that is to be found from the cleanest and most disease-free crop. I can not say whether the price of seed will be lower or higher in the spring; but there is one thing certain, if you plow up your new land and use poor scaley seed on it next spring, it will not make much difference whether you pay a high price or a low price for seed, you will not get as good a crop as you should and you will spoil your land for flax cropping in the future. The thing to do is to find some good seed for next spring and then treat that seed carefully.

If there are any persons in the state interested in buying flax seed and want to know the quality of that seed before purchase, if they will send us a half pound of the seed in its present condition, our laboratory will give you a complete analysis of the contents of the package, telling you exactly what weed seeds are present and what percentage will grow; also the presence or absence of disease, how to treat the seed, etc. For those who are sowing flax on new land it is a very wise procedure to buy some good plump bright-colored flax seed from a crop that they have seen growing, so that they particularly know it is free from both wilt and weed seeds.

LEARN WIRELESS & R. R. TELEGRAPHY!

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Memphis, Davenport, Ia.,
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FROM NATION'S CAPITAL

(Continued from page 9)

land in proportion to the growth of dry matter in the crop.

"Water stored in the subsoil to a depth of at least 6 feet is available for the use of farm crops, and alfalfa is able to draw water from much deeper areas.

"Abundance of water in the subsoil is a great protection to the crop against drought, and moisture in the surface soil, while it may favor the immediate growth of the plant, does not protect it against drought is in almost exact proportion to the total available soil water within the reach of the crop.

"Grass crops (alfalfa and brome grass) dry the subsoil to such an extent on the substation farm that the first crop following grass is wholly dependent on the season's rainfall for its moisture supply.

"A rainfall of from a quarter to a half inch may have a decidedly beneficial effect upon a growing crop and is of great assistance in securing a good stand at seeding time. Such a rainfall has little or no effect in increasing the water in the lower soil unless the surface is already moist from previous rains. Less than a half inch of rain falling on a dry soil mulch does not wet the soil below the mulch and is soon evaporated by the sun and wind."

CLEAN MILK ESSENTIAL FOR CHILDREN

Not that clean milk is not necessary for everybody, but particularly so for children. George M. Whitaker, chief of the market milk investigations of the Bureau of Animal Industry, Dept. of Agriculture, in an address in Washington this week, showed the necessity for pure milk to safeguard the health of the young.

"An extra cent per quart should not stop us from buying clean milk when the lives of our children are in the balance," he said. "Cleanliness in milk not only affects children, but adults, and a lack of it causes typhoid, tuberculosis and many minor diseases.

"An eight-cent quart of milk will equal in food value 29 cents worth of beef. While pure milk may be obtained from the dealer, improper treatment in the house will make it unfit for food, especially for babies. This bad treatment consists in placing it in unclean vessels, in exposing it unnecessarily to the air, in failing to keep it cool, and exposing it to flies.

"Milk absorbs impurities and collects bacteria readily under these conditions,

and while some of these bacteria cause contagious diseases, others may cause digestive troubles, which do not affect adults but are fatal to infants.

"It is extremely important in homes where a contagious disease has broken out that milk bottles are not returned except with the knowledge of the attending physician and under conditions prescribed by him. Neglect in such cases often is the direct cause of epidemics, especially among infants.

"If all the members of a community act in common on this question the mortality will be amazingly reduced, for when the dealers know that clean milk only is acceptable, they will make their dairies hygienic and healthy. Such methods in Boston reduced the mortality among infants nearly 33%, and in Chicago an even 50%."

HOW MUCH DOES IT TAKE TO START A FARM.

This is a question which officials of the Department of Agriculture are often called on to answer. No definite amount of capital can be stated as a sufficient sum on which to begin farming any more than it can be done in the mercantile business. A great deal depends on the price of the land and the magnitude of the undertaking. Just as the merchant may begin with a modest stall and a few dollars' worth of goods, so the farmer may begin with one acre of land or less, on which he may raise part of the food for his family, eking out a living by working part of the year for someone else, or he might buy a large farm and equip it fully. The warning is given, however, that the man without farm experience and without a knowledge of the principles involved in farming who starts the business on an elaborate scale is fore-doomed to failure unless he is so fortunate as to command the services of a trained manager. This is next to impossible. Competent farmers are usually engaged in business for themselves, and our schools of agriculture have not yet fairly begun to supply the demand for men of this class. When the number of such men is sufficient to meet the demand we may expect an important development of large agricultural enterprises.

IS THERE A MILK TRUST.

At a meeting before the commissioners of the District of Columbia who were hearing arguments by District milk dealers this week on the question of pure milk supply, H. O. Trundle and Corbin Thompson, representatives of milk dealers in the District, Maryland and Virginia, declared that a certain class of "rich people in New York and elsewhere" are behind the movement to

compel dealers to pasteurize the products they sell.

"They dominate the health office," it was maintained, "and their sole object is to sell pasteurizers. Pasteurization in Washington alone will raise the price of milk and steal \$450,000 a year from the purses of the poor. This big combine has its aids in every government department and especially in scientific circles.

"There is a gigantic money interest, with thirty million dollars, behind this thing."

The list of men in the "milk trust" as handed to the Commissioners by Mr. Thompson is as follows:

Levi P. Morton, Thomas P. Ryan, Anthony Brady, J. Berwind, Kuhn, Loen & Co., James R. Marse, Henry D. Cook, H. L. Wiley, Hugh Grant Browne, Eugene DelMar, John Flagler, Horace W. Henshaw, Eben Dudley, Lyman B. Kelbourne and W. I. Moody.

The Government experts from the Department of Agriculture who testified at the hearing scouted the idea that a milk trust existed in the United States, and several of them, while testifying regarding the merits of the tuberculin test and pasteurization, asserted that it was almost impossible for so large a combine to exist and still be so intangible.

As a result of the charges, however, the Department of Justice has instituted an investigation to determine whether a milk pasteurization trust with ramifications broadcast really exists.

AGRICULTURAL INSTRUCTION IN U. S.

A recent census by the Department of Agriculture shows that there are 57 collegiate institutions for white students receiving aid from the Federal Government, which give instruction in agriculture, 24 privately endowed colleges giving secondary instruction in agriculture, 58 special agricultural high schools and 28 public high schools receiving state aid, 2 privately endowed agricultural high schools, 155 normal schools and industrial schools for women, 432 public and private high schools and academies teaching agriculture without state or federal aid, 18 institutions offering correspondence or reading courses in agriculture, 34 special elementary schools teaching agriculture, and the 46 secondary and 20 elementary schools teaching agriculture for negroes and Indians, a total of 875 institutions, or an increase of 330 since the issuance of a previous list in October, 1908.

XMAS COMING! See page 10

HONEY

Well ripened clover Honey for Sale, guaranteed absolutely pure and of the finest quality. One 30-lb can 11 1/2¢ per lb.; 2 or more cans 11¢; 12-lb. cans, in full cases of 72 lbs., 11 1/2¢ per lb. Send for price list. Address

M. V. FACEY, Preston, Fillmore Co., Minn

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HOW TO AGRICULTURIZE THE TEACHING OF BOTANY IN THE HIGH SCHOOL AND STILL RETAIN THE ESSENTIAL PRINCIPLES OF BOTANY

By H. F. Bergman, N. D. A. C., Before N. D. Educational Association, at Bismarck, Tuesday, October 18th

Botany is botany and whether it be taught as general, agricultural, pharmaceutical or economic botany the underlying principles are always the same. The only difference is in the materials used to show the application of these principles and even a difference of material or subject matter is by no means necessary to successfully implant the knowledge of the botanical principles which may form the foundation for the study of agriculture, pharmacy or any other subject with which botany is directly concerned.

It is in fact very doubtful whether any text should be placed in the hands of a student with the intention of assigning him lessons therein which he is to study and recite upon. Sciences especially natural or biologic sciences should be essentially laboratory courses and a text should be consulted only after thorough study of the plant or its parts in the laboratory. The use of a text, especially an illustrated one, should by no means be permitted during the laboratory period.

No expensive material or apparatus is required to carry out a very efficient course which may be planned to run one or two terms, one semester, or a year. That the students be supplied with compound microscopes is by no means necessary nor would I consider it even desirable. The first thirty-six weeks of botany should not require microscopes at all.

Bearing in mind the fact that microscopes are not generally used outside of professional work, it is well to train students to observe with the unaided eyes or at most with an ordinary hand lens. There are so many things that may be seen in this way and so many may be acquired which will be of far greater value to them later than the very limited knowledge (?) gained by superficial and faulty microscopic observation possibly can be.

Unfortunately we cannot in this state go out doors at any time during the winter and collect materials for laboratory use, but a good assortment of plants, roots, stems, leaves, flowers, fruits, and seeds can be put up either in a dry state or preserved in formalin for use during the winter. Material in formalin retains its shape and often the natural color as well while the odor of formalin may be removed by washing for a few minutes in water.

Since the study of seeds provides a logical and convenient starting place we may begin there. For our purpose the work on seeds would be more extensive than as given in the ordinary texts. Instead of studying one or two types of seeds during one or two periods a considerable amount of time would be devoted to this part of the work. Students should learn to observe closely enough to be able to recognize all common weed seeds. Of course the structure, food content, and germination of seeds is also studied. Common farm or garden and weed seeds are used in this work. Germination tests of seeds of different kinds of varying age and under different conditions are made and a record of results kept.

On roots some practical studies of absorption, food storage, propagation by roots and modification of the form as adaptation to, or as the results of, use for these purposes, is to be recommended. Beets, turnips, rutabagas, or similar vegetables, roots of corn, wheat, trees and shrubs afford an abundance of readily obtainable material for this work.

Experiments in the composition of plants, i. e., in the proportion of water, dry matter and ash are easily made and make an impression upon the mind of the student that could not be obtained by days of lecturing or text book study. Along with this some experiments in foods needed by plants should be performed. These may be set up by the instructor or by students at the beginning of the term and left in a convenient place so that the students can make their observations thruout the term or course of the experiment.

With leaves and stems a study of the work done by them as shown from experiments is invaluable in addition to the usual study of form and structure which of course should never be neglected. The students will be more interested, however, in finding what work various parts of plants do and how they work. A study of sap transportation, food formation and storage and evaporation of water from the plant are the most important features here.

Flowers of corn, wheat, oats, various garden plants and weeds are desirable for the study of floral structure, pollination, fertilization and development of fruit and seed. Since the students are familiar with these plants they will be more interested in studying them and will more readily grasp the fundamental facts involved. If the student is ever to understand fully the principles upon which the breeding and selection of wheat, corn or fruits, and in fact plant breeding in general, is based he must first understand the structure of the

flower, the function of the various parts of it, the purpose of the pollen and manner of its transfer, the effect of pollination on the development of the fruit and seed, and this understanding will never be complete and definite except by actual study of specimens themselves.

The development of fruit and seeds, their purpose in nature, their methods of dissemination, the effect of such dispersal on the abundance of weeds and finally methods of control are all things that would come naturally from the study of fruits and seeds. The analysis of samples of farm or garden seeds and the detection and separation of weed seeds or other impurities, is a good thing to practise on at times during the term.

Before the close of the term or year study may be made of some of the more common diseases of field and garden crops, not so much a microscopic as a macroscopic study to familiarize the student with the gross appearance of the disease which will enable him to recognize it and detect its presence in the field. The way in which the disease is carried from one plant to another or how it persists from year to year is to be considered. Methods of control would naturally follow after a thorough study of the appearance, nutrition and reproduction of the disease.

Botany ought to be more than a mere study of forms, to make it a really valuable subject, the function of plants and their parts must be considered so that knowledge may be had of how the plant lives and works and above all attention should be paid to the ecological relations of the plant, i. e., the effect of external conditions of factors either physical or biotic which affect the growth and distribution of plants. It is with ecological and physiological relations that the farmer has most to deal and by paying attention to these as well as to study of form and structure we may make the study of botany in high school or elsewhere strongly agricultural and at the same time retain all the principles of the subject as a pure science

NOT A GOOD DIET FOR FARMERS

Mrs. Rorer of cook book fame, says that we should beware of lobsters. The advice is good. The bite of an enraged lobster is most severe and painful. Children especially should be enjoined from handling this vicious insect.

Latest! Special Offers, Page 10

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North Dakota Farmer

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Vol. 12 NOVEMBER, 1910 No. 5

Drought shows up the good farmer to advantage this year. On your 160-acres did you harvest on 40 acres 20 bushels per acre. A friend of mine did but his neighbor found his not worth cutting.

With prospects favorable for another dry year it would be foolish to go on and expect a crop of wheat on land not so farmed as to make such possible. Better be prepared for a dry year, adopt dry farming methods, grow more cultivated crop, especially corn for forage and winter feed.

Did the lightning rod man catch you and get your note for something of a swindle. The patent medicine faker has been working the druggists and now is turning his attention to the farmers. It will only cost you \$76 for your fool experience, but in the end you will get your eyes open and that is something.

The people are awakening to the need of making our common schools more valuable and are putting in agriculture and domestic science, a step in the right direction. Have you a live up-to-date school in your district. If not, whose fault is it more than your own?

What supply of water have you for your stock this coming winter? Does the water contain quantities of alkali, glauber or Epsom salts, etc. If so you can not expect the animals to thrive and you may lose a few of the weaker ones. If ill health is common to the family, why *not see whether the water* has anything to do in causing it or at least, whether a change of water might not help the conditions.

One of the most nutritious and best bread I have had in a long time was made from the grinding of the whole wheat into a fine meal and from this was made a yeast bread, the same as from flour. Such bread is an aid in the prevention of constipation and to a greater extent than the white flour is a substitute for meat.

North Dakota needs more small industries dependent upon agriculture and when our legislators wake up to the needs of our state then they will give an impetus to bringing about a condition that will set these industries in motion. Look at the vast amount of canned corn brought at great expense from Maine, peas and beans from Wisconsin, and so it goes, but we can have them all at home if we but try for them.

If you are a little short on meat as food then remember that peas and beans will take the place of meats. Each of these may be cooked in a score of ways, in soup, porridges, baked, made into sandwiches, etc.; all appetizing, nutritious and cheap as compared with meats. Many claim that those who eat more freely of these vegetables are really more healthful than those eating too freely of meat. I like my New England baked beans and good brown bread twice a week.

Never have we had a season more favorable for doing fall work on the farm. If every thing is not in shape the fault is with the farmer and not the season. The land should be all ready for an early seeding in the spring and with conditions favorable to another dry season for 1911, an early seeding is desirable but more than all else care should be taken to have a good seed bed and a good mulch on the surface to conserve what moisture there is for the dry weather that follows.

Experiments made at the N. D. Experiment Station shows that flour from Velvet Chaff wheat is nearly of the same value for bread making as that for the hard spring wheats, fife and bluestem. Why this difference in price and lowering of grade. Much of Velvet Chaff would grade No. 1 Hard but the buyers rules do not permit it to go better than No. 2 Northern. Why. It has the weight, it has the flour. Then, why this continued fraud on the farmers. Some one has said to give the gamblers and parasites, automobiles, and to elevate them in their own minds above us. How much Velvet Chaff wheat was received at Superior and Duluth in 1910 and how much shipped out? This will tell the story.

HE'S A WILLING FELLOW

If I were you, I'd try to get that reputation. It may not sound very "smart," but it's a good asset. Being willing doesn't merely imply that you just get up and do as you're told. The willing fellow sometimes sees the necessity of doing the other man's work and does it without a murmur. The willing fellow buckles in when occasion demands it. The sorehead stands by and says he isn't paid for that kind of work.

One day a vacancy is open and the firm casts around for a man that somehow or other always seemed to forget whether he was or was not paid for what he did and the "willing fellow" goes up a peg.

Thus the game is played. Thus the law works.

Moral: Forget what you're paid to do—in business.

A NORTH DAKOTA FARMER FOR NORTH DAKOTANS

It is the age of combinations, trusts and "affiliations." Most tempting offers have been made this magazine to sell out to more powerful interests. To all advances we have turned a deaf ear. "Why?" Because we believe that there should be within this state, for this state and by the people of this state a magazine that will boost the interests of this state, a magazine that is fearless in the defense of the health and well-being of the people within the commonwealth.

We have never yet felt called upon to advocate the patent medicine, or other questionable advertisements, even if there is more revenue from that source than from any other. We have not complained because at times our readers failed to mention this magazine when answering advertisements or have simply mentioned "The Farmer," or "Dakota Farmer," thereby giving credit to other magazines in the same field.

We believe with all our heart that the farmers of North Dakota appreciate the work that has been done the past eight years by this magazine. We also believe that every reader will put a shoulder to the wheel and make the NORTH DAKOTA Farmer a power for the conservation not only of moisture, fertility and forests, but of the health and prosperity of every reader.

"How can you help boost?"

1. Keep your subscription paid. If hard up, tell us so and we will do the rest.
2. Speak a good word for the NORTH DAKOTA Farmer to your neighbors.
3. Advertise your goods, if you have any to advertise.
4. Always mention the NORTH DAKOTA FARMER when answering advertisements.

Pure Food Advertisers

The products advertised below are in compliance with the pure food law of North Dakota and of the highest grade.
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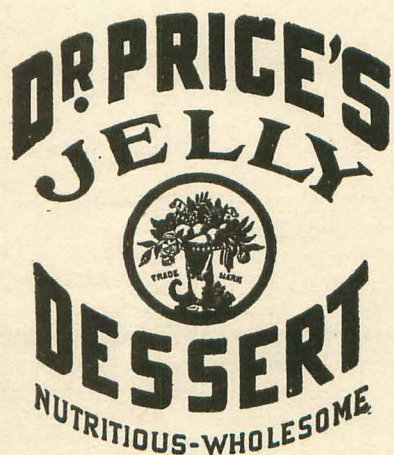
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Pancake Flour

Is a Scientific Preparation of Healthful Appetizing Ingredients and the Best Flour Milled in North Dakota

GUARANTEED Pure and Wholesome

Ask Your Grocer for a Trial Package

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Lisbon,

North Dakota

Livestock Department

PROF. W. B. RICHARDS, Editor

Testing Cattle for Tuberculosis

By J. C. McDowell, Agriculturist, U. S. Department of Agriculture, Waukesha, Wis.

To one who has familiarized himself with the tuberculin test and who has learned how easy a matter it is to keep a herd of cows free from tuberculosis, it seems strange that any farmer will keep a herd of cattle year after year without assuring himself that he is not feeding and milking tuberculous cows. During the five years I was in the dairy business in Fargo, N. D., I was continually on guard against the introduction of this dread disease into my herd, and during that time I had but one case of tuberculosis. Without the tuberculin test it would be impossible to eliminate tuberculosis, or to guard against its introduction; but, on account of the great accuracy of this test in diagnosing tuberculosis, there is now no excuse for any farmer or stock raiser to suffer much from losses due to this disease.

To be sure, there are some farmers who have suffered by having their herds tested by incompetent or dishonest parties, and there are others who have bought stock that was fixed up to stand the test, and I can readily see why some of these farmers condemn the test when they should condemn the rascal that made the test. The test itself has, however, proven so reliable in the work done by the U. S. Bureau of Animal Industry, and in that of the Various State Experiment Stations, that there are now no veterinarians of good repute who condemn it. I have tested several hundred cows, and have no reason to believe that a single mistake was made in passing or condemning any of the number. For example, out of eighteen that responded to the test in one herd, and that were killed under government inspection, all were found to be diseased with tuberculosis. There is always the possibility that the rise in temperature may be due to some other cause, but this source of error can almost always be detected by the careful observer.

A new law goes into effect the first of December this year in Wisconsin, that gives every promise to eliminate tuberculosis from Wisconsin herds. While

the law does not compel the test, it places such restrictions on the sale of untested cattle, that it will be practically impossible to do a profitable business and ignore the test. The most hopeful feature is the fact that almost all the best farmers of the state are in favor of the test and are doing what they can not only to get the disease out of their herds, but to clean the state of tuberculosis. Other states are watching the work in Wisconsin with interest.

Now is the time for North Dakota to wake up and say with Wisconsin, "We are going to get rid of bovine tuberculosis and thus make a demand for our cows, our beef, and our butter." Some say that we cannot afford to eliminate all the tuberculous cattle, but I am well satisfied that we cannot afford to keep these cattle, on account of the contagious nature of the disease. I believe that our state should do as Wisconsin is doing, pay three-fourths of the appraised value of the animals condemned, so that the loss will come on the entire state, and not on the individual who in most cases can ill afford it.

As soon as parents realize the danger of giving tuberculous milk to their children, and learn that the tuberculosis germ lives for a considerable length of time even in salted butter, I am sure that they will demand the tuberculin test for bovine tuberculosis. Compared with the results to be obtained, the expense is of little importance; but, what would we not be willing to pay in order to guard the health and lives of our children.

Begin 1911 Right Improve your stock

Aberdeen Angus Cattle
White Holland Turkeys
White Plymouth Rocks

EASTGATE BROS.

Willobank Farm Larimore, N. D.

Warranted to Give Satisfaction.

Gombault's Caustic Balsam



Has Imitators But No Competitors.

A Safe, Speedy and Positive Cure for
Curb, Splint, Sweeney, Capped Hock,
Strained Tendons, Founder, Wind
Puffs, and all lameness from Spavin,
Ringbone and other bony tumors.
Cures all skin diseases or Parasites,
Thrush, Diphtheria. Removes all
Bunches from Horses or Cattle.

As a Human Remedy for Rheumatism,
Sprains, Sore Throat, etc., it is invaluable.
Every bottle of Caustic Balsam sold is
warranted to give satisfaction. Price \$1.50
per bottle. Sold by druggists, or sent by ex-
press, charges paid, with full directions for
its use. Send for descriptive circulars,
testimonials, etc. Address

The Lawrence-Williams Co., Cleveland, O.

SOLUTION FOR BEEF FAMINE

Guy E. Mitchell, Washington, D. C.

Secretary Wilson of the Department of Agriculture, who recently returned from a speech-making tour thru Ohio, believes he has found a solution to the problem of high cost of meat resulting from the decline of the cattle-raising in the West.

"The decrease in cattle-raising in the West is a serious problem," he said. "The ranchmen are being driven out by the homesteaders and the land is being turned into farms.

"In the South, however, I think we will find another source of meat supply. Hitherto cattle from the South could not be shipped to the North on account of the cattle tick which infested them. Congress, however, appropriated sufficient money for this department to exterminate the cattle tick in an area equal to about four of the Southern states. That work will be continued, and the South may replace the West as the cattle country."

MANURE ALONE NOT ALWAYS SUFFICIENT

Good barnyard manure is often considered the all-sufficient fertilizer for all soils and all conditions. But manure can not take the place of lime. The results of a 5-year experiment by the Ohio Experiment Station with clover hay, are instructive. Where there was no application to the soil the average yield for the 5 years was 1159 pounds per acre. Lime alone brought 1927 pounds; manure alone, 3339 pounds; but lime after manure brought 4,925 pounds.

ONE SOURCE OF FLAVORS IN MILK

G. L. Martin, Prof. of Dairying, A. C. N. D

The effects of poor ventilation in cow stables upon the development of flavors in milk is not always well understood by milk producers. As a rule if the animal is in proper health the milk will be normally pure when first drawn. But if the cow is milked in an unclean stable which is filled with vitiated air the milk will be contaminated and undesirable flavors rapidly develop.

In an endeavor to determine the relation between poorly ventilated cow stables and the development of bad flavors in milk, the writer made extensive investigations with quite definite results.

The plan of the experiment was to obtain samples of milk from cows kept in well ventilated dairy barns and from cows kept and handled by methods commonly found in barns where no system of ventilation was provided. These samples were collected in the stables as the cows were milked, put into sterilized glass jars and kept for several days in surroundings where no further contamination was possible. Each sample was examined regularly every twelve hours with the following results which are an average of the findings from several hundred samples.

	Well Ven-tilated Stables	Poorly Ventilated Stables
Clean natural sour flavor.....	93%	38%
Stable flavors.....	0%	45%
Stale musty flavors	0%	17%
Slightly Ensilage flavors	7%	0%

It will be noted that only 38% of the milk from the poorly ventilated stables gave a clean flavor and that 62% of the milk showed a most filthy contamination. If the cows are kept and milked in unsanitary surroundings, the milk will absorb the stable odors before it can be removed to the milk room as these results plainly indicate.

The presence of an ensilage flavor was detected in a few samples from the well ventilated barns; however this flavor passed off within a short time leaving no objectionable effects. In case of the poorly ventilated stables if any such flavor was present it was entirely covered up by the very objectionable stable flavors. In every case where stable flavors were detected, it was a noticeable fact that they increased with the age of the milk. This was due to the fact that such flavors are produced from the rapid development of the undesirable bacteria.

These results only emphasize the vital necessity of having pure air in cow

ST. PAUL UNION STOCKYARDS COMPANY

Comparison of Receipts and Shipments of Livestock for the Month of October

		Receipts					Total Cars
	Railroads	Cattle	Calves	Hogs	Sheep	Horses	
C. R. I. & P.	294	73	839	218	.....	26	
C. G. W.....	998	129	4172	1803	21	107	
C. M. & St. P.	12302	1012	11591	31316	27	784	
M. & St. L.....	2473	358	8176	1267	20	226	
C. St. P. M. & O.	3082	547	17638	7463	30	428	
C. B. & Q.	401	74	2336	1023	.....	55	
M. St. P. & S. S. M.	14885	2638	13255	10696	.....	741	
Gt. Nor.....	41558	5737	23780	156533	54	2617	
Nor. Pac.....	24505	2816	7742	103097	205	1454	
St. P. B. & T..	.....	.....	.....	.....	.....	.....	
Driven In.....	714	81	844	51	.....	.....	
Total.....	101212	13465	90373	313467	357	6438	
Increase.....	13033	4399	31201	174773	74	1566	
Decrease.....	.....	.....	.....	.....	.....	.....	
Jan. 1 to date	409077	108628	620448	727681	4812	28158	
Increase.....	76040	38479	40016	358474	.....	6032	
Decrease.....	.....	.....	.....	.....	400	.....	
Average Wts.	762	181	212	81	.....	.....	
		Shipments					Total Cars
		Cattle	Calves	Hogs	Sheep	Horses	
C. R. I. & P....	2867	8	563	4288	.....	126	
C. G. W.....	11913	587	20887	46815	8	821	
C. M. & St. P.	13548	916	449	49795	26	716	
M. & St. L.....	703	63	1200	2345	1	105	
C. St. P. M. & O.	15213	888	782	37672	36	858	
C. B. & Q.	27263	838	1258	78269	200	1369	
M. St. P. & S. S. M.	1624	90	.....	47388	4	277	
Gt. Nor.....	258	99	140	7673	20	53	
Nor. Pac.....	486	209	24	1968	3	31	
St. P. B. & T..	.....	.....	.....	.....	.....	.....	
Driven Out....	788	217	88	1635	65	.....	
Total.....	76663	3915	25391	277848	363	4356	
Increase.....	11248	203	15336	163408	100	1382	
Decrease.....	.....	.....	.....	.....	.....	.....	
Jan. 1 to date	288031	29252	134657	563925	5154	14089	
Increase.....	50764	3654	22327	307500	.....	3469	
Decrease.....	.....	.....	.....	.....	27	.....	

Comparison of the Origin and Disposition of Livestock for the Month of October

		Origin of Livestock Received					Total Cars
	States	Cattle	Calves	Hogs	Sheep	Horses	
Minnesota.....	35073	7762	58 53	20465	23	2155	
Wisconsin.....	4517	1187	12936	6913	14	363	
Iowa.....	.....	.....	559	.....	18	10	
Far South.....	.....	.....	.....	.....	.....	.....	
So. Dakota.....	9676	430	6491	7944	46	523	
No. Dakota....	29982	2511	11434	35940	35	1458	
Montana.....	21898	1487	.....	241132	221	1922	
Far West.....	.....	.....	.....	658	.....	3	
Manitoba & NWT	.....	.....	.....	.....	.....	.....	
Far East.....	.....	.....	.....	.....	.....	.....	
Returned.....	66	88	.....	375	.....	4	
Totals.....	101212	13465	90373	313467	357	6438	
		Disposition of Livestock					Total Cars
		Cattle	Calves	Hogs	Sheep	Horses	
So. St. Paul Pkrs	22458	7991	64881	27713	.....	.....	
City & St. Butch.	1325	701	438	859	.....	62	
Outside Packers	3087	321	22006	4211	.....	342	
Minnesota.....	3527	311	1632	26504	96	277	
Wisconsin.....	2455	39	.....	7267	17	138	
Iowa.....	6731	115	1193	13223	16	303	
Nebraska.....	80	64	.....	.....	.....	3	
Kans. & Mo....	340	.....	.....	3998	.....	25	
So. Dakota.....	123	7	.....	676	4	9	

stables and in abundance. All that is required is to have the stables properly ventilated, which can be done with very little expense. Fresh pure air is an absolute necessity both from the standpoint of health of the animals and the production of pure, clean and wholesome milk.

NORTH DAKOTA BUTTERMAKERS AT THE NATIONAL DAIRY SHOW

By Commissioner Flint of the A. C. N. D.

If you can conceive four hundred and twenty-nine of the best individual animals of six breeds of dairy cattle assembled from a territory extending from New Hampshire to Colorado, Minnesota to Kentucky, all the utensils used in connection with stabling and caring for them, feed and machinery; dairy products, including some over six hundred tubs of creamery butter entered in competition, cheese of every variety from all over the world, machinery for handling, storing, and manufacturing it, and then add to this thousands of persons interested in one way or another with the dairy interests in attendance and you can get a partial idea of what the National Dairy show was like.

Those who are accustomed to think of the dairy industry as demonstrated by a few scrub cows, or a roll of butter, would, if they had seen it, have received an awakening that would start some new thoughts. The nearest I can get to explaining it in a few words is to say that it was a magnificent impression of the interest and energy expended in the dairy business.

There were quite a number of North Dakota people there, each studying some particular line or lines in which they were interested. Farmers took great interest in the silos and ensilage machinery, and the stock. Creamery men naturally were looking up machinery in their line and getting new ideas of handling the product they manufacture. Thirteen head of pure bred Holstein cattle were purchased near Chicago by two farmers, eight head go to Glen Ullin, and five to Dickinson.

Many conventions were held by different dairy interests in connection with the show and some of the best speakers in their respective lines in the nation were present.

In the competitive creamery butter contest the North Dakota buttermakers made an excellent showing. For the first time they bring home a "State Cup." The state cups go to the highest scoring buttermaker of any state having ten or more entries of high grade butter. This undoubtedly is a concrete demonstration of the good results of the educational butter contest that was con-

No. Dakota....	494	.....	4	213	.....	1	15
Mont. & West	121	8	20	.....	.....	.....	4
Far South.....	736	.....	.....	209	.....	.....	28
Manitoba&NWT.....	.....	.....	.....	.....	.....	.....	.....
Mich. & E. Can..	153	.....	.....	2151	.....	.....	13
Chicago.....	34650	1960	95	212238	159	2404	.....
Ills (ex Chicago	17329	106	3	1907	9	561	.....
Eastern Points	5446	195	.....	4019	61	168	.....
Returned.....	66	88	.....	375	.....	4	.....
Totals.....	76663	3915	25391	277848	363	4356	.....

ducted the past summer by the dairy department, J. M. Hein of New Salem, is the winner of the cup.

The North Dakota buttermakers who entered the national contest and their respective scores are as follows:

J. M. Hein, New Salem, 93.33; Hans Larson, McKenzie, 93.16; Gust Kruempel, La Moure, 92.50; F. W. Powlison, Casselton, 92.33; C. H. Tellman, Rosebud, 92; P. H. Olson, Dickinson, 92; F. F. Zabel, Richardson, 91.33; William Engel, Ray, 90.66; Phil Palmer, Steele, 90.50; E. A. Greenwood, Marion, 90.

A keen interest in the dairy development of North Dakota is shown by persons in the older dairy states. We have been heavy buyers of pure bred dairy stock during the past few years and naturally breeders are interested. Those handling equipment for bars, silos, etc., and persons looking for locations for creameries, as well as farm dairymen, look to our state as the land of opportunity. If we can hold this interest there will be some great development along dairy lines in the near future.

When writing advertisers please mention the North Dakota Farmer.

GRAND AWL OFFER, PAGE 2

RANGE CATTLE ON THE DIVERSIFIED FARM

By B. G. L. Martin, N. D. A. C.

The old cattle ranges in the northwest have changed to prosperous farming communities. Old extensive range conditions are outgrown and in their place have come the more extensive modern methods of farming. Where once thousands of beef cattle grazed and fattened now are grown fields of grain not well adapted to fatten beef for market. The change has been so gradual that few people fully realized that old conditions were actually passing. The cattle that formerly furnished beef for the market now supply milk

No matter what cream separator you purchase now

SOONER OR LATER
you will buy a

DE LAVAL

The more you come to know about cream separators the better you will understand the overwhelming superiority of the DE LAVAL.

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BREEDER OF: Black Percheron and Hambletonian Horses, Red Polled Cattle, Poland China Hogs, White P. R. Chickens, White Holland Turkeys, White Embden Geese, White Pekin Ducks and White Guinea Fowls.

GROWER OF: Minnesota No. 169, Spring Wheat, Swedish Select Oats, White Hulless and Success Beardless Barley, Turkey Red Winter Wheat, N. D. 959 Winter Rye, Northwestern Dent Corn, Early Ohio Potatoes, Timothy and Alfalfa.

Young Stock and Pure Seed, for sale. Write me for particulars.

J. A. ENGLUND, Prop.

Kenmare, North Dakota.

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COGSWELL, NORTH DAKOTA

SHETLAND PONIES. All colors, ages and sizes.

REGISTERED ANGUS CATTLE. Most popular families.

HEAVY DRAFT STALLIONS AND MARES. TWO SPANISH JACKS.

WOLF AND FOX HOUNDS that will catch and kill.

PET STOCK OF ALL KINDS.

PURE BRED POULTRY.

We can please you both in Quality and Price

L. H. WHITE, Prop.

COGSWELL, N. D.

for the dairy. In short, many farmers are trying to make a cow that always has been bred for beef purposes fit into a place where economical milk production is desired.

Perhaps the strongest factor in retarding improvement of dairy cows is the old illusion held up by fanciers of beef breeds—the "dual purpose" cow. There are many influential men thruout the country who have advocated "dual purpose" breeds and too many farmers have been content in the belief that beef breeds can be made to produce milk in abundance, while at the same time store up flesh on their backs. A great many people have overlooked the point that flesh making and milk making are two distinctly different processes, not usually carried to any degree in the same animal. True there are a few cows among the beef breeds that are very exceptional milkers just the same as there are some very poor milkers among the dairy breeds. However, the all important point which "dual purpose" advocates fail to recognize is that the majority of so-called "dual purpose" breeds fail to transmit their milking qualities to their offspring. This fact alone makes it impossible for a farmer to build up a dairy herd from a beef breed in any reasonable length of time.

It is hardly a paying proposition for a farmer to shelter, feed and care for a cow twelve months a year for a period of ten years when she produces milk only six months per year just for the "beef" her carcass will furnish when butchered. If a dairy cow has been a persistent milker for ten months each year during her working period of ten years it would be folly to expect her to change her very nature at the end of that time and store up flesh in preparation for the end. Flesh making is largely cell addition while milk making is a cell division. These two processes are altogether different and not usually combined to any degree in the same animal. If any animal is to produce a wealth of flesh; the muscular tissue must be present and nourished from the time the calf is born. This requires that the back body and limbs of the animal be heavily supplied with blood vessels and nerves in order to convert the food material into flesh. Just so with the dairy cow. From the nature of her makeup, numerous vessels and nerves must be supplied to the udder thus conveying the food material of the blood to that organ and convert it into milk.

The same principles hold true with cows as with the other animals. If a man wants a draft horse he breeds for that type. He does not expect

extreme draft and speed in the same animal. Likewise with the swine. The lard and bacon type are two distinct characteristics. Different in external appearance and equally as different in utilization of their food. The type of hog used in any section of the country is always determined by the kind of feed raised and the market demands. In the corn belt proper is found the lard type of hog while outside of that region the bacon type prevails.

The northwest is largely out of of the corn belt, consequently the main fat producing grain is not grown extensively but foods suitable to producing milk are grown in abundance. For that reason, every man who keeps cows should aim to select those that will utilize to the best advantage the home grown feeds. Profit in the dairy industry depends upon a minimum cost of feed coupled with a maximum production of milk.

Many farmers thruout the northwest realize the growing necessity of combining stock raising with grain farming. However, many have failed to realize that the beef breeds of cattle suited to range conditions a few years ago are not the most profitable type to keep under present conditions. Truly they are trying to fit a square peg into a round hole.

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Hilldale, Wyo., Dept. 5

Poultry Department

Geo. Hausmann, Hillsboro, N. D.

PREPARING FOR WINTER

In writing this article we take it for granted that the fowls have been taken proper care of during the fall. It will be our aim to point out the things that are absolutely necessary to house the fowls, in order to get results. Many farmers do not realize that they have poultry on the farm until they see their birds suffering. To house a flock of chickens successfully during the winter is not such an awful thing as the most imagine it is. Anybody can do so, with a little time too.

The house will not have to be such an expensive affair as the most people believe it ought to be. The principal thing is to have no draughts anywhere in the house. It will therefore be well to look around, and find those little cracks in the walls, that do the most harm. Fix up your house at least so a person can not look thru the walls. Having done this it will be necessary to have good ventilation. We would advise no ventilation system, but the cloth front. There must be enough fresh air getting in, so it will keep the walls dry. People that have a large house and only a few



Poultry—Pin-money—Profit.

In speaking of preparing for the winter, we look more at getting the houses into their proper shape, for it is impossible to house them without a comfortable house. By comfortable we do not mean, that it has to be warm, but a house kept cleanly and well ventilated. The winter profits to be derived from a flock of fowls depends largely upon their housing and keeping. It is unreasonable, therefore, to expect hens kept in a damp and filthy house to produce eggs, and they simply will not do it. It is easier for a farmer at this stage of the year to fix up his house a little, than before the real winter sets in. In fact, if it is shoved off until then it will never be done, and the results will be a lot of ropy and profitless hens, and a disappointed owner.

hens would do well to fix up some sort of a place or box with a curtain in front that can be let down in the evening. This is all that will have to be said about the house.

Having the house now so that it will be comfortable it ought to be disinfected. Burning sulfur is about the cheapest. The fowls must be chased out, and windows must be fastened securely. This done, start your sulfur, and close the door as you leave the building. Keep the house closed as long as possible. The house then ought to have a thoro cleaning and then again in a few days the house ought to be infected again. This is about the best way to kill vermin. The roosts and dropping boards then ought to be painted with liquid lice killer, a good deep

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H. P. COOPER, Casselton.

litter put on to the floor, and then your house is put into a fairly good shape.

However, before putting your birds into winter quarters dispose of all surplus stock. If you have not sufficient room to properly house your birds it will be better to sacrifice a few birds than to overcrowd the quarters. Overcrowding means disease and disaster. Do not tolerate it under circumstances.

EGGS NOT HANDICAPPED BY LAW

Doctor Harvey W. Wiley, Chief Chemist of the Department of Agriculture, when asked the question how long eggs could be kept in storage or in some preservative, without violating the pure food law, said:

"As long as some one can be found to buy them." He said he regretted such a condition of affairs, but as the law stood, nothing could be done about it.

Eggs may be preserved, he added, in benzoate of soda, sulphate of copper, alum, or sulphuric acid, but the Department can do nothing unless the eggs are decayed, or some deleterious preservative is used.

Canned eggs are used mainly in bakeries. It is not thought that they are served in cafes—fried, boiled, or scrambled—as they can be distinguished easily from fresh eggs when put to such use.

OUR AWLOFFERTAKES, PAGE 2

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Seeds, Trees and Gardens

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POTATO CULTURE

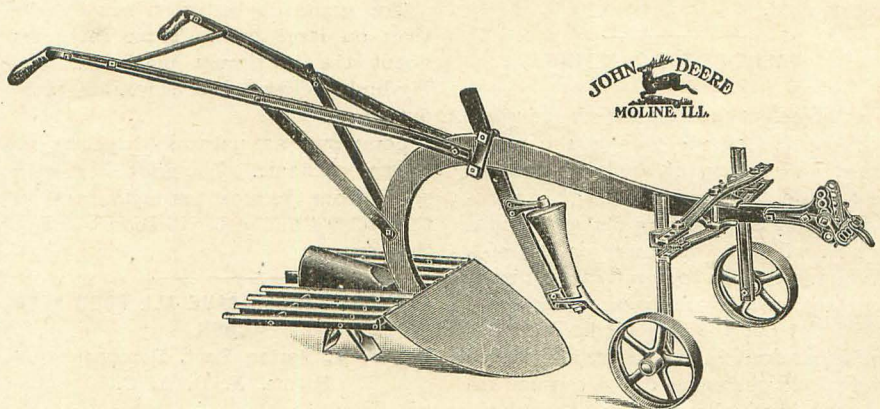
Early History

Like most of our important cultivated plants, the early history of the potato is somewhat lost in mystery. We know it to be a native of South America and probably of the western portion. As early as the middle of the sixteenth century, it was being quite generally cultivated by the Indians, along the western coast of South America. The wild plant is not known for certain, at the present day, for the plants now growing wild in Chili and in the Islands off Patagonia may have escaped from cultivation. However, these wild

Spaniards. From Virginia it was soon taken to England and thence to Ireland. The potato has been introduced into Spain and Portugal directly from South America.

Potato Digging

Tho it is rather late a few hints on this topic may not be amiss. Potato digging should be delayed until the tubers have reached maturity, if such delay does not carry digging on too late in the season. A matured tuber can receive much more handling without breaking the skin than an immature tuber. If the skin becomes broken, the tubers will lose more in weight than with an unbroken skin and consequently



plants, if escaped, are probably much the same as the original wild plants. These plants do not differ materially from the modern potato plant, except in the size and quality of the tubers. The original potato was probably an annual, reproducing itself by seeds. The tubers were certainly very small and could hardly be depended upon to carry the plant over from one year to the other.

Other Kinds

The potato is closely related to some of our most common weeds. The vile smelling nightshade, which bears an abundance of green berries and is found everywhere in this state, is closely related to the potato. But there are other plants found wild in South America and one even in Mexico, which are really potatoes, tho they seem to have no possibility for improvement. One, however, Commerson's potato has some chance for amelioration.

Introduction to This Country

Potatoes were cultivated in the colony of Virginia at least as early as the latter portion of the sixteenth century, probably having been introduced by the

if the crop is to be stored considerably more loss will ensue. A broken skin also doubtless impairs the quality of a tuber and so for these reasons, full maturity is desirable.

Immature Seed for Planting

It is claimed that potatoes which have not reached maturity, which are dug while still green, will yield more than potatoes similarly grown, but which are matured. If this is found to be generally true, it may be advisable to dig the seed crop at an earlier period than the main crop.

Other things being equal, that variety will yield the most which has the longest growing season, but which at the same time reaches practical maturity. If a very long season variety is selected, it may be cut off by frost, while the majority of the tubers are just getting their growth. In such a case the yield will be much reduced.

In North Dakota, it is not safe to leave potatoes in the ground later than the first week in October, for by the 10th we are apt to get such severe

freezes that a considerable percentage of the crop will be spoiled.

Methods of Digging

In the old time days, our mothers used to send us out to the garden with a hoe to dig the potatoes for dinner. This good old way is now improved upon, where areas of any size are to be harvested. Small patches may be dug by a long-handled manure fork if the digging is to be done by hand, but in these days of high-priced labor, hand labor is becoming obsolete whenever possible. If one or more acres are to be dug, very good results can be secured by the use of a two-horse digger, similar to the one shown in the cut. With this implement, the potatoes are dug clean as rapidly as the horses walk and they are left free upon the surface of the ground, ready for picking. Two men with horses can dig several acres a day with this tool. It does very satisfactory work. As suggested in my last article, a portion of the crop should be dug by hand in order to save the best hills for future seed.

VALUE OF TOP-GRAFTING

If some enthusiastic friend—or worse yet, a tree agent—tells you of some splendid variety, of apple or pear or peach, don't make the more than probable mistake of setting out an orchard which will turn out more or less of a failure. Rather top-graft a few bearing trees or a few limbs on one tree and thus test out the new kind. You will get your fruit in two or at most three years and then you can determine intelligently whether you want an orchard of it or not.

It is not unusual to see a fairly good crop on a three-year old top-graft.

Varieties which on their own roots are weak, unthrifty or disease-inviting, make excellent crops when top-grafted on strong-growing trunks. The Northern Spy is an example of an apple tree practically immune from the attacks of the woolly aphis. It is sometimes planted and worked over to other varieties.

Grafting is one of the most interesting things on the farm and it is absurdly simple. A little desultory practice will soon produce expertness. What could be more fascinating for the boy than to teach him the rudiments and then let him work over some old apple tree with a different variety on each limb—a dozen kinds on a tree—sour, sweet, early, late, big and little, crabs, even pears can be grafted on apple tree tops. Peach grafts will grow on apricot and plums on peach trees and vice versa. Of course it don't pay to work over poor weak roots. The source of energy—the root system—should be vigorous.

The writer had a row of "Smith's Cider." The trees were vigorous growers but the apples rotted badly. I top-grafted them to "York Imperial" and in 4 years when in leaf the row was hardly distinguishable in point of size from the adjoining rows.

Top-grafted trees tend to grow upright but this can be overcome by pruning.

Top grafts do better on small stubs than on large ones. Three inches is about the maximum diameter. The big limbs below can be sawed off without injury.

Some trees are naturally bad bearers, tho true to name. Top graft them with scions from the most productive tree in the orchard and you will soon be more than even.

FARMERS SHOULD SAVE ALL GOOD SEED CORN

By W. R. Porter, Supt. Demonstration Farms, N. D. A. C.

The past season has shown, as never before, the value of seeding at least a small field of corn for seed purposes on every farm. In many sections the hay crop was an almost total failure, the same may be said of barley and oats for feed. The amount of straw is, also, quite limited; millet seeded late, also, failed to a large degree owing to the exceptional July drought and the coolness of the August weather. Corn is the only crop that has produced large quan-

ties of feed in all but the very dry districts of the state which are underlaid with a light subsoil.

Consequently next year there will be a larger acreage of corn seeded than ever before as the farmers want to be sure and have an abundance of feed of some kind and not again be caught as they were this year. Corn did not ripen except in a few fields thruout the state owing to the early Spetember frost. For this reason good North Dakota grown seed corn is liable to be very scarce the coming spring and it will undoubtedly command a good price.

Any farmer that has matured a good crop of corn this year will be well repaid if he takes some trouble to save it for seed. The corn should be picked now, either out of the field or shock and only well matured ears should be selected. These should be thoroly air-dried before November 1st. Probably the best way to do this is to hang the ears of corn up, or place them on horizontal racks made of poultry netting in an open shed or granary having a good roof that will not leak. Before winter sets in the seed corn should be fire-dried by placing in the attic or in some room having the benefit of heat yet where the temperature is not too high and where no steam or other moisture penetrates. Under no circumstances should seed corn be stored in granaries over other grain or in barn lofts over livestock, as it will absorb more or less moisture, and freezing temperatures are very liable to weaken if they do not destroy the germ. Seed corn if it is perfectly dry will stand quit ea low temperature without injury, but even a light freeze will injure it if the corn contains a little moisture. The corn should be left on the cob all winter and a germinating test should be made in the spring to see if it will grow good and strong as well as test a high percentage of live kernels.

WEED SPRAYING

Spraying experiments by the Ontario Agricultural College and Experiment Farm indicate that mustard in standing cereal crops may most effectively be destroyed by the application of 100 lbs. of iron sulphate in 50 gallons of water during bright sunny weather just before the plants bloom. A heavy rain within 24 hours after spraying lessens the herbicidal activity of the solution. Whiten- ing put into the solution renders the sprayed strips visible. Field bindweed, sow thistles, Canada thistles, and the plantains were not destroyed by the solution. Attempts to kill bindweed by applying 9 to 20 lbs. of iron sulphate crystals to patches 4 by 6 ft. resulted in only slight damage.

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FARGO SEED HOUSE, Fargo, N. D.

See Ad Offer, Page 2--A Winner

School and Home

Agricultural Education in the Public Schools

By J. H. Worst, Agricultural College

(Concluded from October)

Rural talent must be capable of participating as freely in shaping the political and financial policy of the country as any other class of citizens. Every important movement affecting the public welfare should be directed by country people to the extent of their numbers and their interest in the movement. Otherwise, the urban population takes everything and gives nothing, except what it can not use. The producer is as important as the distributor.

But Few Graduates

But a comparatively small number of our young people, and especially of those country-bred, can ever hope to enjoy the advantages of a college education. The educational statistics for the year 1906 show that only a trifle over one-tenth of one per cent of our total population was enrolled in colleges and universities. For the same year, less than one per cent of our population was enrolled in high schools, while almost twenty per cent of our total population was enrolled in the elementary schools. Moreover, it is estimated in the Middle West that 98 per cent of those enrolled in the country schools begin and end their education in the one-room school house. Speaking of these children, Supt. O. J. Kern, of Illinois, comments as follows: "It would seem reasonable that, the training in the subject matter of the Course of Study should more closely relate to their life on the farm. Tradition and a course of training for a professional life, should no longer dominate the secondary and the elementary schools, especially the country schools."

* * * It is now time that the actual needs of the country child be considered in selection of materials of study. Especially is this true for the 98 per cent of the country children who do not attend the high school."

Broadly speaking, then, for the vast majority of the 17,000,000 school children comprising our pupil population, efficiency for citizenship rather than popular scholarship or literary culture should receive paramount consideration. These children rarely expect to become professional men or women, hence the folly of training them exclusively along

the road that leads—to the professions. They do expect, however, to become useful citizens, the vast majority of them industrialists of one character or another, therefore what training the public schools can offer should fit them for the sphere of activity they will occupy. The public schools should teach persons **how to live** even if it becomes necessary to discard some of the cherished ideals entertained by reactionary educators. The material welfare of the many must not be sacrificed for the benefit of the favored few. Those who are destined to perform the world's work, create the world's wealth and bear the chief burdens of the government, but who will be in position to enjoy fewest of the luxuries of life, are entitled to the most direct and efficient educational aids that money or genius can provide for them.

The short courses in elementary agriculture and domestic science which the agricultural colleges have arranged for farmers' children—courses that could readily be adopted by the high schools—have been more than justified by the eagerness with which the subject matter has been pursued, the interest it has awakened and the added enthusiasm with which boys and girls, after completing these courses, look forward to their lifework.

But, as before stated, the agricultural colleges can not reach the tens of thousands of the country's best young blood, every one of whom has a personal interest in and need of this type of education. And doubtless realizing this fact, Congress wisely authorized the agricultural colleges to use a portion of their Federal endowment for the preparation of teachers of elementary agriculture and the mechanic arts. Naturally, reasonably, and logically, the agricultural colleges are best qualified to suggest courses of study in elementary agriculture, superintend the instructional work and as far as possible prepare teachers for the public schools. These functions logically are inherent in every educational institution that represents a distinct and definite type of education. Their faculties are composed of trained experts, their laboratories are thoroly

equipped with necessary apparatus and demonstration material and above all and most important of all—they are in sympathy with agriculture. No mere institutional rivalry should impede a movement of such vast and direct benefit to the agricultural interests of the country. Rather, all should give it aid and encouragement.

Not Exclusive

It is not intended, however, to bar normal and other schools from preparing teachers of elementary agriculture. The assistance of all training schools will be required to organize and equip this new educational propaganda. But the teachers of **teachers** must be saturated with the new educational ideals. The country teachers, especially, should be trained by instructors, not only experts themselves, but in full sympathy with country life—sympathy born of personal contact and actual experience. In every other department of educational work, this is required and why not in agriculture?

We can not expect the best training on the part of the public school teachers, at least not for a considerable period, but those who attempt to prepare them for their duties should be not only agricultural graduates but filled with sympathy and enthusiasm for the cause. Nothing can retard or bring this propaganda into disrepute more surely than to have it administered by incompetent hands or directed by those not in hearty sympathy with its purposes.

Why Teach Agriculture

"Every race dug its civilization out of the ground."

That which is most vital to a commonwealth—to its prosperity and very existence—can not with safety be excluded from the purpose for which its educational energies are expended. The farmer and his mode of life are vitally essential to the existence of both state and nation. His is the only class that produces—for practically everything comes from the soil. The soil, therefore, is the chief source of wealth. Its care, management, and protection, the common heritage of all, is at his mercy. The country's greatest natural resource is in his keeping—to conserve or to injure.

The farmers' investment aggregates more than \$50,000,000,000, their number comprises nearly half the population of the entire country and the wealth they produce exceeds \$8,000,000,000, annually.

The farmer feeds the world. In addition, he produces the raw material that supplies the factory, which in turn gives employment to millions of skillful workers. From the farm and factory flows our unprecedented commerce. He is a useful citizen. Without him our great

ships would rot, locomotives become junk and cities fall into decay.

The farmer holds this masterful position among the country's productive forces. The soil—God's benediction to humanity—over which he is lord, will soon descend to his children. The country demands that they be not educated away from the farm, but toward the farm, and that country life be made not only agreeable, but **desirable**.

"The educational propaganda for a better country life is now the very first requisite for an economically and socially sound and enduring civilization."

For these and many other reasons, agriculture should occupy a prominent place in the courses of study provided for the public schools. Nor are the subjects embodied in agriculture wanting in

to manage them; how the laws of Nature operate and how to vary or modify their effects; how to improve plants by selection, hybridization, and breeding; how to judge domestic livestock, etc., and lastly, how to produce domestic animals approximating perfection, or how to double and even treble the yield of crops of every description and enjoy the work more than to take a vacation.

Every subject related to agriculture fosters the habit of observation. While they may not take equal rank with mathematics in forming habits of concentration, yet they train an altogether different set of faculties—faculties that are even more frequently called into use in daily life. Agricultural subjects naturally provoke a spirit of inquiry—a thirst to know more of Nature. They



It's Time the Rural School Was Given a Square Deal.

either interest or educational value. Agriculture embraces the soil and what grows from the soil. It also includes all the transmutations from vegetable to animal life and animal products. The physical sciences hold perpetual convention on the farm. It is God's great workshop and who works there, works with God. Agriculture and Nature are almost synonymous terms.

The first lessons in agriculture are simple and readily understood by the child. They embrace the natural objects he is familiar with, that he takes a lively and home interest in. He sees them every day, works with them, depends upon them for life and pleasure. From the beautiful and curious, he gradually comes to understand the useful. Learns of soil and its constituent elements; relation of moisture and fertility to plant growth; how to conserve the one and increase the other; habits of plants, insects, and animals; which are beneficial and which are harmful; diseases of plants and animals and how

also tend to coordinate the school with the home, for the reason that agricultural subjects interest the parents as well as the child and they will, at night, be discussed around the fireside at home.

Beginning with nature study and enlarging the scope of observation, making collections of flowers, plants, seeds, insects, weeds, etc., investigating their habits and noting their peculiarities and otherwise prying into the secrets of Nature becomes fascinating to children, develops their powers of observation, awakens the spirit of inquiry and creates within their minds not only a profound respect for their father's occupation, but a deep sense of relationship between the farm and the creative hand of God.

Naturally the simple, elementary investigations and inquiries lead into more complex fields of thought as the child mind becomes more mature. How the forces of Nature can as readily weave the sunlight, raindrops, air, and earth elements into grass, which in turn

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is transmuted into butter, or wool, or into bird, insect, or man himself, gives scope for largest play of childish imagination, and leads ultimately to an earnest desire to study and understand the chemical and biological facts upon which these phenomena are founded.

The child mind thus can readily be directed toward the simple facts of external Nature, for they are his first and most constant companions, and if directed aright—he will later desire a knowledge of the forces that play about him and to acquire power to direct them and make them subservient to his will.

All this brings him into ever closer communion with Nature, not as the poet, but more so—as a creator—a co-creator with the Almighty.

Volumes might be written without exhausting the beauties, the mysteries, the fascinating interest that attaches to every one of the thousands of subjects contained in God's great text book—agriculture; and when children are introduced to it by the heart-earnest teacher, then compulsory laws and truant officers will become obsolete. Interest will draw them to the school room with keener alacrity than compulsory laws ever drove them there. Naturally, our young people and their parents must see in their school something attractive, something useful, some interest and profit, before they will make the right degree of effort to patronize and support such a school.

Never Consulted

One fatal weakness that attaches to our course of study prepared for the public schools is the fact that neither parents nor children were ever consulted as to their wishes or needs. How to provide a way to reach the freshman class of the university seems to have been the dominating idea, and for that purpose human genius could scarcely have devised a more perfect scheme. But where 17,000,000 children start and only 136,000 land, the sacrifice of children's rights is too great, especially as the sacrifice falls most heavily upon those that can least afford it. The well-to-do can go to college under any circumstances; the average child can not. Exception should be made, therefore, for the great majority of our children, especially country children and subjects for study provided that they are personally interested in,—subjects, the value of which they can readily see.

Overcrowded Curriculum

To overcome the difficulties of an overcrowded curriculum, many academic subjects should be abridged.

Take arithmetic as an example:

The pupil that does not expect to pursue his studies beyond the eighth grade should not be required to master half the subject matter contained in the average arithmetic. The ordinary busi-

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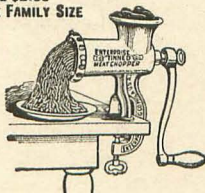
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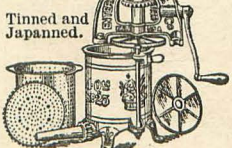
It is strongly made and every part does its work without a hitch. Plate fits perfectly and cylinder is bored absolutely true. Pressure will not cause meat to rise above plate. The patent corrugated spout prevents air entering the casing, thus assuring perfect filling and preservation of sausage.

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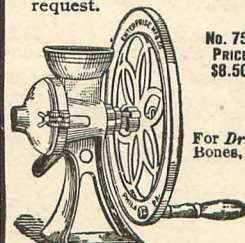
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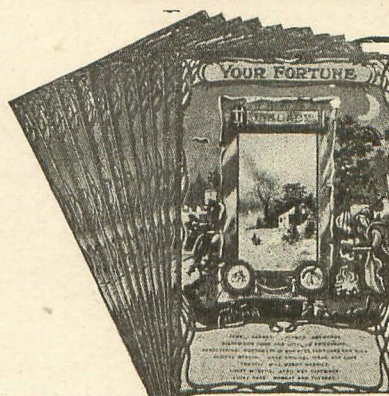
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ness man has no practical use for much that the child is now required to study, and as a consequence the pupil is apt to acquire a hazy knowledge of many arithmetical processes and a clear, quick, accurate knowledge of none. In view of other and more useful subjects that should engage the pupil's time—subjects containing material more closely related to the life of the future farmer and that still possess cultural and disciplinary value—arithmetic should be so abridged that only the study of those problems in ordinary business use should be required. What is required, however, should be thoroly mastered and opportunity given for its mastery. Addition, subtraction, multiplication, and division, common and decimal fractions, the tables in general use, a very few of the applications of percentage and some of the problems in mensuration embody practically all of the ordinary business calculations that are required by the average farmer. Better that he be sharp, quick, and accurate in these calculations and totally ignorant of others, such as square and cube root, than to be uncertain and foggy in all.

Then the subject matter contained in the test examples should relate almost exclusively to farm products, articles of farm consumption and such business problems as confront the average farmer, not forgetting that thru the subject matter of the problems themselves these may be made instructional as well as disciplinary.

It must be remembered that 98 per cent of eighth grade pupils can not hope to become scholars in the popular sense and hence should not be required to lay the foundation, while studying arithmetic, for the entire preliminary ground work of the mathematics required in the higher education. Furthermore, by thus eliminating needless details and redundant matter from several of the required academic subjects, considerable time will be saved for the study of elementary agriculture. If any inconvenience is occasioned, let it fall upon the 2 per cent who desire to go beyond, rather than upon the 98 per cent who can not.

Much of geography also may be omitted with advantage to eighth grade children by limiting the subject more closely to home and local geography. Many of the details with reference to campaigns and battles should also be omitted from the United States History required in the country schools, and fully one-half of the pages devoted to technical grammar could also be omitted with profit. With the academic subjects thus abridged, ample time would be available for laying a very fair foundation for elementary agriculture, domestic science, or manual training, in the common schools.

The eliminations here recommended may seem like educational heterodoxy, but I am pleading the cause of that mighty army of children, the future bulwark of the nation,—the great industrial class that is doomed never to grace the halls of college or university, but soon—perhaps too soon—must enter life and engage in productive labor. I would free them from the tyranny of the higher institutions that prescribe for them courses of study that, like stepping stones, lead from grade to grade to educational heights they can never reach. I would give them instead at least some elementary vocational training that will make their work pleasanter, whether on the farm, in the shop, or in the factory.

Producers and Consumers

Society is made up of two general classes—producers and consumers. Naturally, producers stand first in importance, yet the consumers have a monopoly on the means of education—especially of higher education. The farming class stands out preeminently conspicuous among the producers of the country. Farmers' children should not be denied the privilege of studying elementary agriculture—in the public schools. It is theirs by right and the quality of instruction provided should be earnest and not perfunctory. The public schools must be redirected and adapted to the needs of the people. They must be vitalized and point to things direct and certain, instead of things general and conventional.

The changed economic and industrial conditions of the country make a change in our educational ideals imperative. We have devoted and are still devoting too much energy in preparing a favored class to make its living off the other fellow. The higher institutions have too long made a business of education and are dealing in millions of human units to train a few thousand, generally for professions already overcrowded, tho the industries are begging for workmen and the margin of the world's food supply is growing small. The farm and not the office is in need of occupants. The army of educated consumers is pressing too hard upon the untrained producers.

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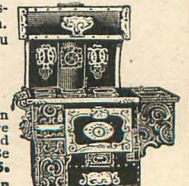


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In Conclusion

A recent number of the Outlook contains an article on "The Martian and the Farm." The writer supposes that an inhabitant of the planet Mars visits the earth and tells his impressions of education in the United States. I close with the following brief extract:

"If the proverbial inhabitant from Mars were to visit an ordinary American rural school, he would be inclined to comment somewhat as follows: 'I notice that these Americans seem to think the raising of crops quite unnecessary and they are applying their remarkable intelligence to the task of depopulating their rural regions. They have the acuteness to see that if they are to drive people out of the country, they can not begin with the adult population. Life in the open country is so alluring and natural that even when it has not been made as comfortable as it easily might be, it holds people fast. So these far-seeing Americans, in order to crowd people into the cities, where they obviously want them to be, have devised a campaign of education directed against the children. They have planned all their rural schools on city models. Even in such details as arithmetical problems, they see to it that the children's mind should be directed toward urban life. They so fill the field of a child's attention with the affairs of the town and city that they leave no room for ideas that concern life in the open country. Year after year these Americans fill their children's minds with city ideals, and as soon as the children are liberated from school they leap for the city. It is a great task these Americans have undertaken, but they will finish it in a generation or two; and then they will have the satisfaction of seeing their land divided between the crowded city and the wilderness.'

"If this visitor were to be told that what he interpreted as an astute campaign was a mere matter of stupidity and tradition, and that the American people were really wondering how they could check the conjection of the cities, he would be forced, out of decent respect for the people he was visiting, to be credulous. How can the child born and reared in the country respect the life of the farmer when the community in which he lives does not regard the farmer's occupation as worthy of study? How can he be expected to look with ambition toward agriculture as a vocation when he finds that training for it is regarded as less important than preparation for a clerkship? How can he think of village and rural life as anything more than a makeshift when he finds that in the school he attends, there is not a word taught concerning crops or cattle or roads?"

Elementary Agriculture

McNeal. C. James, Editor

Wheat is one of the oldest of our cultivated plants. Its cultivation dates back beyond recorded history. The earliest Lake Dwellers of Western Switzerland grew a small variety as early as the Stone Age. Egyptians and Chinese speak of it in their earliest writings. Heads of wheat have been found in Egyptian pyramids, placed there about 3300 B. C. The Euphrates Valley is supposed to have been the original home of the wheat plant.

Not only has it been grown since prehistoric times, but is more universally grown today than any other cereal crop. The main reasons for its long continued and wide-spread cultivation are:

1. It is easy of cultivation.
 2. Adapts itself readily to a great variety of soils and climates.
 3. It supplies a large amount of nutritious substance with small amount of preparation.
 4. It possesses special qualities which make it suitable for light-bread making.
- In number of pounds wheat is the

third largest crop in the world. While the United States produces over three-fourths of the corn of the world, Europe produces twice as much wheat as the whole of North America, and more than all the rest of the world put together.

The four leading wheat producing countries of the world with their yield in millions of bushels are as follows:

Europe with	1,765
North America	760
Asia	446
South America	155

The leading wheat states of our own country as a ten-year average are:

Kansas	70,551,256 bu.
Minnesota	69,283,845 bu.
North Dakota	56,040,401 bu.
Nebraska	39,481,912 bu.
South Dakota	39,293,294 bu.

Wheat responds to careful cultivation as do other crops. Land for wheat should be plowed about six inches deep. Early fall plowing usually gives best results and is best on account of busy work in spring. The soil should be firmed and



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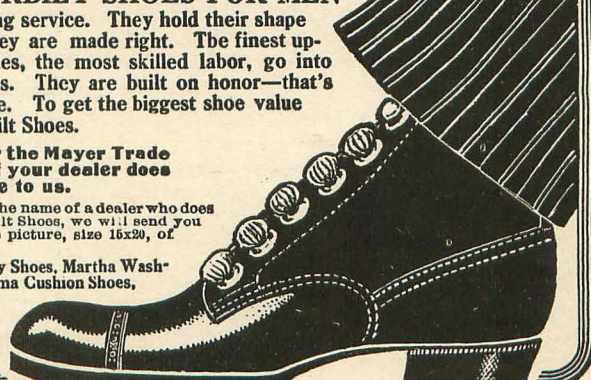
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a mulch produced on top to save moisture. Farmers should always select plump wheat to sow by cleaning it with a fanning mill and if possible it should be pedigreed seed. The seed should always be tested to determine its power of germination. This can be done by placing about a half-inch of sand or soil in the bottom of a common dinner or pie plate; upon this sand a blotting paper or cloth should be placed. Count out a hundred seeds, lay upon the blotter, cover with a second blotter or cloth; dampen the whole until it is saturated with water, invert a second plate on top blotter and keep in a temperature of 60 degrees to 80 degrees. After several days count the seeds which have germinated. Wheat seed should be selected from that grown in the section of the country where it is to be sown if possible, as it does better than that shipped in from a distance.

To prevent smut troubles the wheat should be treated with the formaldehyde mixture, one pound of it to forty-five gallons of water. Early seeding usually gives best results as rust attacks it when sown late. Wheat is usually sown at the rate of five to six pecks per acre and is put into the ground about two inches.

Wheat needs cool, damp weather in the beginning of its growth; when it begins to fill it needs dry, cool weather in order to grow plump. One of the superior qualities of the wheat grown in this state is the large percent of protein in it, due probably to cool weather at the time of filling, along with a short season in which to mature. This is desirable, as it gives the wheat better milling qualities.

The different grades of wheat used in the northwest are:

No. 1 Hard Spring Wheat.

This wheat must be made up mostly of Scotch Fife, must be sound, bright, well-cleaned and weigh fifty-eight pounds to the measured bushel.

No. 1 Northern Spring Wheat.

Sound, well-cleaned, weighing not less than fifty-seven pounds, and composed of hard and soft varieties, with the hard predominating.

No. 2 Northern Spring Wheat.

Sound, reasonably clean, of good milling quality, weighing not less than fifty-six pounds to the measured bushel.

No. 3 Spring Wheat.

Inferior, shrunken spring wheat, weighing not less than fifty-four pounds.

No. 4 Spring Wheat.

Inferior spring wheat, badly shrunken or damaged, weighing not less than forty-nine pounds.

Rejected Spring Wheat.

All spring wheat grown, badly bleached or for any other cause not fit for No. 4 wheat.

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Seasonable Receipts

Baked Apple Sauce

No apple sauce will compare in richness of flavor with that baked in this simple manner: Pare and quarter the apples, put into jar or porcelain pan, sprinkling sugar between the layers in same quantity as for stewed sauce. Pour on about a cupful of water to prevent burning at first; cover, and bake several hours. The sauce will be a dark red and is delicious served with cream.

Apple Ginger

This is easily prepared; as it will keep for weeks it can be kept on hand for emergencies: Chop five pounds of peeled and cored sour apples. Mix with these three pounds brown sugar, the juice and rind of three lemons, an ounce of ginger root and enough water to cover the fruit. Cover and cook slowly for several hours, adding water if necessary.

Apple Snow

Quarter and core, but do not pare, three large apples. Stew or steam, then drain and rub thru a sieve. Beat whites of three eggs stiff, add half a cup of powdered sugar, then add the apple and beat until like snow. Pile on a glass dish, garnish with bright jelly and serve with boiled custard made with the yolk or with whipped cream.

Deepdish Apple Pie

Line a porcelain pudding dish with rich biscuit crust, rolled thin. Fill with sliced apples sprinkling layers with bits of butter and sugar. Grate nutmeg over top layer and add a cupful of cold water. Cover with crust, making gashes for escape of steam and bake in a moderate oven. Serve with plenty of cream.

Apple Filling for Cake

Peel and grate 2 rather tart apples; add grated rind and juice of 1 lemon, 1 egg, 1 cup sugar. Boil 5 minutes, cool and use for filling.

Apple John

Make a batter of 1 cup flour, 1 tablespoon butter, salt, $\frac{1}{2}$ cup sweet milk, 1 well beaten egg, 1 teaspoon baking powder and pour over 1 pint sliced apples in a buttered pudding dish. Bake and serve with sugar and cream.

Cracker Stuffing

To two cupfuls very fine, plain cracker crumbs add one-half cupful of butter melted in one-third cupful of hot water. Stir together and add salt, pepper and prepared herbs.

If after removing the core for baking apples the hole is filled with honey, the flavor will be found very pleasing.

For the Thanksgiving Turkey

Old-fashioned stuffing: Pick to pieces the inside of one or two loaves of stale bread (according to size of turkey); mix thoroly with this half a cup of butter to each loaf, rubbing with the palm of the hand. Add salt, pepper and some kind of herb (preferably thyme) and just enough cold water to hold together the breadcrumbs. If liked add a little minced onion.

Oyster Stuffing

Add oysters to the bread that has been rubbed with butter and moisten with a little of the oyster juice. To prevent the oysters being overdone it is well to partly roast the turkey first and then stuff and finish cooking.

If bread is so dry that it can be rolled fine, mix the crumbs with 2 or 3 eggs to which have been added enough milk so that the crumbs will be moistened without being made soggy. Add a little butter and onion or herbs as desired. This is good with any roast and is an acceptable way of using the dry slices of bread which will sometimes accumulate.

Always roast a turkey breast down so that the juices will go into the white meat rather than away from it.

Plum Pudding

One heaping cup bread crumbs, 1 cup chopped apples, 2 cups flour, 1 cup suet, chopped fine, 1 cup currants, 1 cup raisins, 1 cup molasses, 1 cup sweet milk, 1 tablespoon soda in molasses, 1 teaspoon salt, $\frac{1}{4}$ teaspoon cloves, 1 teaspoon cinnamon. Steam 3 hours over boiling water.

Molasses Pudding

One-half cup butter, $\frac{1}{2}$ cup molasses, $\frac{1}{2}$ cup hot water, 1 egg, 1 tablespoon vinegar, 1 teaspoon cinnamon, 1 teaspoon soda, 2 cups flour. Steam one hour.

Sauce: 1 cup sugar, $\frac{1}{2}$ scant cup butter, 1 egg, $\frac{1}{2}$ cup hot water, $\frac{1}{2}$ lemon, or serve with whipped cream.

Cranberry Tapioca

Cook until clear and tender 1 cup tapioca. Cook and strain 1 quart of cranberries; mix with the tapioca, add a little salt and sugar to taste. Serve with cream.

BIRDS, THE FARMER'S FRIENDS

Aside from the good cheer which the presence of birds inspires, their economic value is very great. Birds are our greatest natural check upon insects, tending to prevent their undue increase and preserve the proper balance in nature. They feed upon caterpillars, grubs, cutworms, beetles, bugs, butterflies, moths, grasshoppers, chinch'bugs, plant lice and many other destructive insects. Some birds are on hand all the year to guard the crops and trees against the ravages of insects.

Another large service rendered by birds is the destruction of various rodent pests such as gophers, spermophiles, mice and rabbits which work such havoc to trees and crops when they become numerous. The annual loss occasioned by insects and rodents amounts to several million dollars each year in the United States. This loss is increasing as tillage increases and birds are destroyed. Hence it is of the greatest importance to agriculture that our valuable native birds be preserved and everything possible be done to allow them to increase. The third great line of service is in the destruction of weed seed. Many kinds of birds feed upon the seeds of noxious weeds, in this way destroying countless millions of seeds that otherwise would germinate and spring up to pollute the fields, lessen the yield of grain and lower its market value. The service rendered here amounts to many million dollars annually in the United States.

Certain birds also serve as scavengers, consuming decaying animal matter that otherwise might become a source of pollution of our air, streams and water supplies thus endangering health.

The use of native game birds for food is an important item also and may be made even more important thru the proper conservation and increase of our native game birds, and by domestication and rearing as permitted by the present North Dakota law.

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HOW TO COOK MEAT

Of course every good housewife knows how to cook meat. That is a most foolish proposition to make and one which a good cook will take as an insult, but the real truth exists that not many in cooking the meat know whether or not it is being prepared in such a manner as to preserve the nutriment. In this age of high price of beef it is probably most important that this secret be known.

The Department of Agriculture in conjunction with various experiment

stations has made a careful study of this subject and the following conclusions have been reached: The chief loss in weight during the cooking of beef, and doubtless of other meats also, is due to the driving off of water. When beef is pan broiled there appears to be no great loss of nutritive material, particularly if the material adhering to the pan is utilized in the preparation of gravy. When beef is cooked in water from 3 to 20 per cent of the total substance is extracted and found in the broth. The material thus removed from the meat is not an actual loss if the broth is utilized for soup or in other ways.

ected by good wagon paint applied once or twice a year and by keeping the wagon from exposure when not in use. Keeping the wagon painted is not an expensive operation. The wagon could be given a coat of good paint twice a year for \$1 and supposing this was done for twenty years, the actual cost would be \$20 which expenditure would be the means of saving a \$150 or \$200 wagon. It would be hard to find a better investment, nor does it require a great deal of figuring to figure out the profit on a transaction of this sort. The manufacturers of harvesting machinery base and arrange their output on the life of a binder, reaper, mower, etc., being seven years, whereas if kept properly painted and under cover when out of season, its life can easily be prolonged to twice seven years.

Then, too, there is another strong point which should not be lost sight of, that is its real estate value. A farm on which the buildings are painted, well preserved and attractive has a much greater market value than one which has been allowed to run down, remain unpainted and acquire a general slovenly appearance. The increased real estate value which such property has, by reason of being "good to look at," is out of all proportion to the amount spent on the paint.

And lastly there is what might be termed the "social" side of the painting question. It is impossible to take the same degree of pride in a poorly painted house as in a well-painted one, or derive as much pleasure from living therein. We are not capable of our best works when our surroundings are not pleasant, cheerful and attractive. In fact to such an extent are we influenced by our environment that the painting of houses, barns, etc., has a greater influence on our financial and mental progress than we would perhaps think possible. It pays to "Brighten Up."

By a recent arrangement the management of the North Dakota Farmer is in a position to give specific and valuable information to farmers on the painting question. We will be glad to answer any questions pertaining to paint and painting in what we believe will be a thoroughly satisfactory manner.

The life of wire-fencing may be prolonged by painting. It has been estimated that the ordinary farm type of fence can be painted at an expense of about 1 cent per rod. The main difficulty in painting wire is the kind of paint. Paints which may have given good results on house or barn are not necessarily suitable for putting on wire. In general the advice of some person familiar with paint technology should be taken before selecting a paint suitable for galvanized wire.

OILS, PAINTS, AND PAINT PIGMENTS

THE VALUE OF PAINT ON FARM BUILDINGS AND IMPLEMENTS

By A. J. Howe

Ten or fifteen years ago the American Farmer, when he wished to build a house, barn or fence, chopped down a few trees on his land and sent the logs to the local saw mill to be cut into the proper size for his purpose. Increasing consumption assisted by waste and extravagance has reversed the situation to such an extent that more than eighty-five per cent of the farmers today are dependent on the lumber yard. A house or barn which cost \$500 fifteen years ago now costs \$1000, and will probably cost \$2000 a few years hence. An average barn costing \$2000 will as a rule, lose its value in about twenty-five years. It therefore costs \$80 per year on an average—other losses not considered. But if painted, two coats when new and one coat every two or three years afterwards, it will last fully fifty years or more, thus bringing the cost down to less than \$55 per year, (these figures include cost of applying the paint) netting a saving of more than \$30 per annum. In reality, however, the profit would be about double \$30 because of the increased price of lumber and the losses to crops and stock because of a leaky or draughty building thru which the weather penetrates.

A recent investigation of 90,000 barns in Ohio, Illinois, Indiana, Michigan, Minnesota and the Dakotas shows that approximately 60,000 have not been painted for about seven years; 18,000 have been painted within three years; 9,000 within the last two years and 3,000 were in such a condition that it was impossible to tell whether they had ever been painted or not. It will be

noticed from the above figures that two-thirds of these buildings have not been painted for seven years. It is only in extraordinary cases that even the best paint made will last and protect a building for that length of time.

Decay of lumber sets in the minute the surface of the wood becomes unprotected and exposed to the weather. It absorbs the dampness which expands under the influence of heat or cold causing the wood to crack and seam which is the beginning of the end. When those 60,000 barn owners, together with the 3,000 who have neglected to paint altogether, find that the dampness and frost, etc., have so dealt with their barns, that they are no longer serviceable, they will be confronted with the discomforting situation of paying approximately twice as much for a new barn as they did for the old one which they have allowed to decay.

Another leak in the farmer's profits during the past, and to a great extent at present, is that occurring thru the premature decay of agricultural implements. This question has been given considerable attention within recent years for the farmer has come to see that if he allows his reaper, binder or plow to be warped by the sun in summer and rusted by the snow and rain in the winter, he will have to buy others which cost money, and lots of it. Nowadays the agricultural machinery generally finds a place in the barn or especially built shelter when not in use in the summer or winter, but the average farmer has not awakened to the necessity of using paint on his implements as a protective agent. The average life of a farm wagon is claimed to be six years. It should be twenty years at least. The first five years should show scarcely a crack. This is true of most of the vehicles, implements and machinery on the farm. The wagon can be kept pro-



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